Emphasizing FORAGES

This issue of Farmer's Digest emphasizes grassland farming. In addition to others, it carries twenty selected articles about green chopping, silos and silage, mow driers, hay, pastures.

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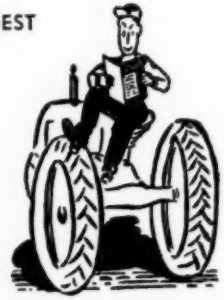

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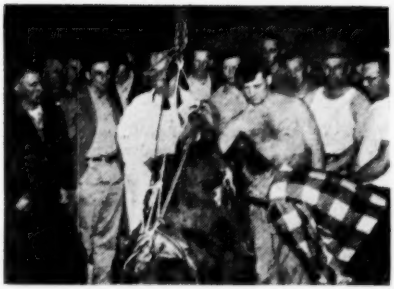

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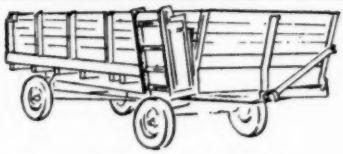

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The Farmer's Digest

Volume 21 August - September 1957 Number 3

Good Forage Is High Quality Feed

Too many farmers underestimate the value of good forage . . .

Condensed from The Furrow

NO MATTER how you "slice it" for your livestock — as pasture, green chop, silage, chopped hay, or bales—high quality forage is a lot more than a roughage; it's top notch feed. And, the higher the quality of the forage, the better its feeding value. Therefore, it's good management to give careful attention to all steps of forage production in order that the best possible feed can be obtained.

W. M. Myers, head of Minnesota's agronomy department, pointed out recently that "Good forages can be *as high in feeding value as what we now call concentrates.* Based on present feeding standards (and these standards may be too low for really good-quality forage) 4 to 5 pounds of alfalfa hay contain as many digestible nutrients as 3 pounds of corn. In protein, 2 to 4 pounds of alfalfa equal 1 pound of cottonseed cake or 4 to 8 pounds of corn."

Milk from Forages

Milk can be produced efficiently from forages. In fact, many dairy cows attain high production on good-quality forage without any concentrates. In a New Jersey experiment, for example, cows produced up to 10,000 pounds of milk per year on forages alone. This was 82 per cent of the production of a comparable herd fed concentrates with forage in a 1:3 ratio.

Reprinted by permission from The Furrow, Moline, Illinois

Then, too, by improving the quality of the forage fed with concentrates, you can further improve milk production. In USDA trials at Huntley, Mont., dairy cows fed U. S. No. 1 alfalfa hay produced 6 pounds more milk per day than a similar group fed U. S. No. 3 alfalfa hay.

Beef can be produced and fattened to good or choice market grades on a ration containing considerable forage. This is being done today at a few experiment stations and by many farmers. In Purdue studies, steer calves fed 35 pounds of corn silage and 3½ pounds of Supplement "A" gained over 2 pounds daily during a 126-day feeding period and at a feed cost of 14.1 cents per pound of gain. In a similar feeding trial at Pennsylvania State University, steers fed 44 pounds of corn silage plus 3 pounds of supplement each day, gained 2¾ pounds daily during a 70-day feeding period. The feed cost per pound of gain averaged 11.1 cents.

Quality Forages Cut Feed Costs

Feeding good quality forage can lower the cost of producing meat and milk. This is possible because feed nutrients obtained from forages are less costly than feed nutrients obtained from concentrates. For example, it costs the following amounts to produce 100 pounds of TDN with these crops:

Pasture	$1.65
Alfalfa silage	2.30
Corn silage	2.75
Hay	3.00
Grain (concentrate)	5.20

In a feeding trial with dairy heifers in Minnesota, early-cut hay was shown to be worth $47 per ton in terms of gain compared with $50 per ton for grain concentrates. Then, too, a Michigan experiment showed that feed costs of milk production could be reduced 20 to 25 per cent by making better use of high-quality forage and by reducing the proportion of nutrients obtained from concentrates. Those last pounds of milk, forced from the cow by heavy concentrate feeding, are usually pretty expensive.

Improved Practices Essential

Farmers tend to have a too-casual attitude toward their forage crops. Many who would be acutely concerned because of a poor row-crop stand can apparently look on a similarly poor forage stand with complacency. Research now in its fifth year at USDA's Agricultural Research Center, Beltsville, Md., is showing that substitution of a few simple practices for seeding methods now commonly used can boost forage yields several times over in the first harvest.

USDA agronomists recently compared broadcast seeding and fertilization with drill seeding and band fertilization. A tall-fescue

and Ladino-clover mixture, seeded broadcast at the rate of 4 pounds of tall-fescue and 1 pound of Ladino per acre, and fertilized at the rate of 750 pounds per acre, yielded an average 817 pounds of weed-free dry matter per acre in the initial harvest. When the same mixture was drilled and fertilizer was banded 1-inch below the seed, per-acre yield of dry matter averaged 2,865 pounds.

"Americans are getting stronger. Twenty years ago it took two people to carry $10 worth of groceries. Today a child can do it."

Improved harvesting methods would similarly improve the value of most forage crops. When making hay, for example, harvest the crop at its most nutritious stage, condition it to reduce curing time and to save the carotene-packed leaves. After baling, provide storage which will protect the hay from moisture and the sun's bleaching rays. Other harvesting practices will also improve the feeding value of silage and chopped hay.

More Feed Per Acre

Contrary to popular opinion, forage crops are high-producing crops—or could be if farmers would give them as much attention as they do their corn, wheat, or cotton. Here are a few examples of the potential feed value per acre of a good forage crop: One ton of alfalfa hay has as many feed nutrients as 22 bushels of corn. Therefore, it would require an 88-bushel corn crop to equal a 4-ton hay crop or a 110-bushel corn crop to equal a 5-ton hay crop.

On the basis of protein production rather than total nutrients, the advantage in favor of forage is even greater. A ton of alfalfa hay contains as much protein as 50 bushels of corn. Therefore, a 5-ton hay crop would equal a 250-bushel corn crop in protein production. It's a lead-pipe cinch that many more farmers are producing 5 tons of alfalfa hay per acre than are producing a 250-bushel corn crop.

Substituting a well-managed forage crop for a row crop would be justified on many farms, resulting in higher feed nutrients produced per acre and, consequently, lower-cost milk and meat production. On the other hand, by increasing forage yields per acre, you will be able to furnish your livestock with plenty of nutritious feed and, at the same time, release a few acres for the production of a cash row crop.

Good forage when produced and harvested by up-to-date methods is high-quality feed.

Tips for Testing Hay Moisture

Condensed from American Agriculturist, Ithaca, New York

THE job of making quality hay is a challenge each year. Is the hay ready to rake? Is the hay ready to bale? How can you tell?

A few observations and simple tests help to determine when the hay is ready but the effects of variety, season and stage of maturity make experience and judgment invaluable. The table below is not infallible, but it will serve at least as a guide to gain experience and judgment for better hay making in the field.

Thumbnail Test:

Choose a sample from center of windrow. Scrape stem with thumbnail. Outer skin scrapes off easily and moisture is visible until moisture content drops to 28 or 30 per cent. Try at least a half dozen stems.

Twist Test:

Choose sample from center of windrow and twist it. No "juice" appears on twisted stem after hay dries to 28 or 30 per cent. Stems feel slightly tough down to 24 per cent.

Approximate Moisture in % (Wet Basis)	Conditions of Hay and Recommendations
70-75	Freshly cut.
50-55	Well wilted. Ready to windrow.
45	Start baling for storage curing with heated forced air. Make bales loose. Juice can be squeezed from stems.
35	Start baling loose bales for heated forced air curing. Juice can barely be squeezed from stems.
30	Pliable; leaves start to rattle.
28	Twist test and thumbnail test show "no juice." Leaf shattering may start if not raked soon enough.
27	Bales show smear on sides as they leave the baler. Bale tension is set light.
25	Safe storage point for loose bales, space-stacked for ventilation. Fresh bales show light smear on sides.
22	Safe storage for loose hay and dense bales — with the possibilty of some heating near center of stack or tightly packed bales.
20	Dry, brittle, excessive shattering.

Dairymen Like Green Chopping

They say they get nearly twice the yield per acre, but hauling pasture to cows has disadvantages as well as advantages . . .

Condensed from Prairie Farmer

Jim Lilly

GREEN chopping, the term commonly applied to the practice of hauling pasture to cattle, has the same advantages and disadvantages pointed out a few years ago. Advantages are that you get more production out of a given amount of pasture, and you have almost complete control over the roughage consumed by your herd.

Main disadvantages are that it's a daily proposition whether you have wet or dry weather, and there is some extra labor involved. You may also have to have extra machinery to do a good job.

Here are some other things that Purdue dairy specialists point out about green chopping. They say it is all right if you are geared to handle it from the labor and machinery standpoint.

Strip Grazing

If you think green chop is just a little too much for your operation, seriously consider rotation or strip grazing. Either system will return nearly as much in production per acre as will green chop. Your labor requirements would be about the same, however.

Purdue specialists say that cattle will bloat on green chop the same as on pasture. They say they have had plenty of bloat trouble with some of the cows in their green chop experiments.

Another thing about green chop, you may run into some trouble with plant recovery if you don't cut at the right stages. With many plants, no one seems able to say what is the right stage to cut for fastest recovery.

Let's take a look at green chop practices used by two Indiana dairymen. Harry Meehan, Hamilton county, has been green chopping for the past several years. He doesn't use a fixed system for green chopping, but varies some of his practices to fit pasture and weather conditions.

For instance, he starts green chopping early in the spring with rye or barley, goes to strip graz-

Reprinted by permission from Prairie Farmer, 1230 Washington Blvd., Chicago 7, Illinois

ing with his herd from mid-May until about the last of June, then switches back to green chopping for the remainder of the summer.

If he has plenty of rainfall to keep good pasture growth, Meehan will green chop for the day feeding and graze at night.

He says that he has very little shade in his rotation pastures and he thinks that he gains in production by keeping the cattle near shade and water in the daytime during hot weather. If Meehan doesn't get enough rainfall to keep his pastures in high production, he green chops for both day and night feeding.

Meehan says that he gets at least twice the forage from an acre by green chopping rather than grazing. On rye, he ordinarily figures on 25 acres to take care of 60 head of cattle for about three weeks. By green chopping the rye, he was able to use only 7 acres in 7 weeks.

The second year with 10 acres of rye for the 60 head of cattle, Meehan wasn't able to use up all the pasture before the rye became unpalatable.

He thinks chopping rye helps the consumption and his cattle did exceptionally well with it. Meehan says winter barley may be an even better early spring grazing crop than rye. He has tried small plots of barley with his dairy herd and found that he could get more production out of the barley and that the cattle ate more of it than they would with rye. He likes barley because it has more leaves and isn't as stemmy as rye.

Surplus for Silage

Right now with his herd of 35 cows, Meehan figures it takes about 25 acres of pasture, but he has plenty of surplus forage for silage. When he was running his 60-cow herd, Meehan figured that the 25 acres of pasture would handle the herd, but he had to use other forage for supplemental feeding when the pastures did get short.

Meehan uses an alfalfa, ladino, orchardgrass pasture mixture. He likes the orchardgrass because it recovers faster from pasturing and mowing in dry weather.

Meehan says that mature orchardgrass is not palatable, and you have to keep it pastured down to realize the best results with it. He finds that cattle eat orchardgrass if it is not over 10 inches in height.

For frequency of chopping, Meehan again depends on the weather. When it's hot and muggy, he chops twice a day. In clear, dry weather he chops only once a day. Meehan doesn't have too much trouble in wet weather. He says that it slows down the chopping, but if he watches the size of the load he puts on each bunk wagon, he has no trouble.

Bloating is another problem

that Meehan thinks he has pretty well solved. It's his observation that bloating seems to run in cow families. He had four generations descended from a chronic bloating cow. All four of the cattle were dangerous bloaters. Meehan sold the cattle out of his herd and hasn't been troubled since.

Don Sheline, Elkhart county, Ind., started green chopping last year for the first time. He plans to continue chopping this year and has built another wagon so that he can supply green chopped forage to dry cows and some of his herd replacements.

Sheline started green chopping for several reasons. First, he wanted to make his pasture go further. He figures he gets about twice the forage from one acre by green chopping. Another reason was the layout of the farm.

No Fences Needed

A portion of the farm is cut off by U. S. 6 and he has a state highway which runs right by his house. Then several gravel roads also run through parts of the farm. Sheline says fencing gets pretty expensive when you have so many roads, and he thinks he can green chop cheaper than he can construct fence.

Sheline says that he doesn't spend any more time green chopping than he would getting cows in across several roads. Also, he has no problems with shade and water because the cattle are always near the buildings for both.

For a forage mixture, Sheline uses an alfalfa-brome mixture during the early part of the green chop period and sudangrass for the end of the season. He did chop some clover last year, but this year he thinks he will have plenty of green chop materials from the alfalfa-brome and sudangrass.

For the 45 head of mature cattle last year, Sheline started with 10 acres of alfalfa-brome, switched over to 20 acres of real thin clover for a couple of weeks, then started on his 5 acres of sudangrass.

Pastures Some

Sheline pastures his cattle on some small fields close to the house during the early part of the season and then switches to green chop. He hasn't had any trouble with bloat and doesn't think that he will in the future. He fertilized his pasture with 200 pounds of 0-10-30 to the acre along with 100 pounds of ammonium nitrate.

Both Sheline and Meehan think that green chopping works well for them, and they plan to continue with their programs. They think that the big advantage to green chopping is the increased milk production from an acre of forage, both say they get nearly twice the yield by chopping rather than pasturing.

Corn Silage for Sows

Tests at Iowa State show that corn silage — properly supplemented — makes an excellent and low-cost base ration for sows during pre-gestation and gestation.

Condensed from Iowa Farm Science

C. W. Johnson, V. C. Speer, C. C. Culbertson and D. V. Catron

THE COST of the pork you produce starts with the selection and feeding of your sow herd—long before the pigs are weaned. And savings gained before the pigs are farrowed are fully as real as those you can make after farrowing!

Sows kept in a lean condition but fed rations adequate in energy, protein, vitamins and minerals, generally farrow the best litters. Experiments with more than 2,000 pigs farrowed at Iowa State College have shown that corn silage, properly supplemented, makes an excellent low-cost base ration for brood sows during pregestation and gestation. In addition, the use of such a ration appears to improve reproductive performance.

Is It Practical?

Our farrowing results for 1955-56 indicate the potential of properly supplemented corn silage as a feed for brood sows.

We hand fed corn silage and a 20-per cent protein corn silage balancer to 186 sows and gilts. These sows and gilts farrowed an average litter of 11.3 pigs; only 4.4 per cent of the pigs were stillborn, and only 4 of the 186 females farrowed litters of less than 8 pigs.

In 1954 at the same farm, 231 sows and gilts self-fed a complete bulky ration farrowed an average litter of 9.4 pigs; 50 of these females farrowed small litters of 2 to 8 pigs each.

Using 1956 prices we found the calculated feed cost per pig farrowed to be 20 to 30 per cent lower for sows hand fed the supplemented corn silage ration than for sows self-fed the bulky ration.

What Quality Silage?

Use only choice-quality corn silage for feeding sows. Sows don't readily eat silage made from corn in the hard dent stage. For the best sow feed, cut the corn while it's still green and, preferably, before frost.

While cattle usually will eat most of any coarsely cut silage,

Reprinted from Iowa Farm Science, Iowa State College, Ames, Iowa

sows tend to sort out the unusually large pieces of stalk and brown corn husk. So, for sow feed with a minimum of waste, the finer the chop the better.

Any type of silo that will keep silage well can be used. If corn silage is used for other classes of livestock, either a temporary or permanent silo should work well.

Size, however, will be more important if the silage will be used only for sows.

A sow won't readily eat more than 10 to 12 pounds of corn silage per day. If hogs are your only livestock, the use of silage for sows will be determined either by the number of sows in the herd or by the size of the silo. For a small operation with no other livestock available to make use of silage, it might be worthwhile to consider the use of a large plastic-bag type silo. With herds of 50 sows or more, however, the use of larger conventional silos would be more economical.

How Fed?

You'll find that corn silage can

TABLE 1. Recommended Alternative 20-Per Cent Corn Silage Balancers.

Ingredients	Alternative compositions 1	2	3	4
8½% Corn (ground)	702	702	802	852
16% Wheat middlings	300	300	300	400
44% Solvent soybean oilmeal	250	250	250	300
50% Mean and bone scraps	300	300	300	300
32% Condensed fish solubles	50	...	100	...
17% Dehydrated alfalfa meal	200	200	200	100
26% Distillers dried solubles	50	100	...	...
Defluorinated phosphate (30% Ca, 18% P)	20	20	20	20
Salt (iodized)	20	20	20	20
TRACE MINERAL PREMIX	8	8	8	8
3% Molasses	100	100	...	...
VITAMIN PREMIX				
Vitamin D[2], million I.U.	2.0	2.0	2.0	2.0
Riboflavin, grams	4.0	4.0	4.0	4.0
Calcium pantothenate, grams	10.0	10.0	10.0	10.0
Niacin, grams	25.0	25.0	25.0	25.0
Choline chloride, grams	60.0	60.0	60.0	60.0
Vitamin B[12], milligrams	20.0	20.0	20.0	20.0
TOTALS (lbs.)	2,000	2,000	2,000	2,000

best be fed on a concrete slab or in large troughs. For a trough, allow about 1½ feet of trough side for each sow. Width should be around 18 to 30 inches; depth 6 to 8 inches. A high lengthwise partition in the middle of a 30-inch-wide trough or a high side on one side of an 18-inch trough will prevent sows from walking across. Crosswise partitions, though not essential, can help overcome the problems of "bossy" sows.

The ideal time to start feeding silage is about 3 to 4 weeks before breeding. This allows time for the sow to get accustomed to the change of feed before breeding time. This makes is possible to flush or full-feed the sow on a well-balanced ration 2 weeks before breeding. To get sows started on corn silage, we suggest "priming" the silage with about 1 pound of shelled corn per head daily. This will encourage the sows to start eating the silage. The corn silage and the "corn silage balancer" may all be fed at one feeding. Thus, it's not necessary to feed more than once a day.

Don't start feeding corn silage right at breeding time. If you can't change the feed before breeding, wait until immediately after breeding.

Research has shown that full-feeding a sow starting about 10 days before breeding will increase the number of ova released by the sow — and that reducing the amount of feed to about two-thirds of full feed for several weeks immediately after breeding will increase the per cent of ova that survive.

Our own research with the corn silage and 20-per cent protein corn silage balancer indicates that a low level of feeding (about 70 per cent of full feed) for the first two-thirds of gestation followed by full feed for the last third will increase average litter size by about 1½ pigs. This is why we advise making the change to corn silage at least 3 to 4 weeks before or immediately after breeding.

If a man is not enthusiastic about his job, either the job is not big enough for him, or he is too big for the job.

The concentrate ration used with corn silage should be a 20-per cent protein "corn silage balancer (as shown in table 1) to supply nutritional needs not supplied by the silage.

If your sow herd isn't large enough to justify custom mixing or if you prefer to build your own concentrate, you can approximate the corn silage balancer as follows: Get a high protein (30-35 per cent) brood sow supplement from a reliable feed manufactur-

er. Adjust the feed to approximately 20-per cent protein by adding about an equal amount of ground shelled corn. Since energy is a major consideration, it doesn't seem advisable to use a large percentage of ground oats.

To take advantage of the recent findings of research, we suggest that the 20-per cent protein corn silage balancer be fed as outlined in table 2. Where necessary, the amount of balancer fed can be adjusted up or down slightly to compensate for the amount of corn in the silage and the general condition of the sow.

Along this same line, the sows should be kept lean and not allowed to become fat before breeding or during the first two-thirds of gestation. Three-fourths of the fetal development takes place during the last third of the gestation period. This is the time to increase the level of balancer fed as shown in table 2 to provide ample nutrients for the rapid fetal growth during this period. A total gain during the 16 weeks of gestation of 50-70 pounds for sows and 80-100 pounds for gilts is adequate.

Limitations?

The producer *already using corn silage for other livestock* will find that it pays to use silage for sows also. In this case, there'd be no expense of providing additional ensiling facilities to offset the savings possible by feeding corn silage to relatively small herds.

If you would like to leave footprints in the sands of time you had better wear work shoes.

Multiple-Farrowing

Corn silage works well for large

TABLE 2. Recommended Feeding Levels for Corn Silage Balancer.

Feed once daily all of the corn silage that the sows and gilts will clean up readily. This will be about 10-12 pounds per head daily. The 20-per cent protein corn silage balancer should be fed once daily at the following levels:

	Flushing period	*First two-thirds of gestation*	*Last one-third of gestation*
GILTS.....	4 to 5 lbs.	3 to 3½ lbs.	4 to 5 lbs.
SOWS.....	4 to 5 lbs.	2½ to 3 lbs	4 to 5 lbs.

When starting sows or gilts on corn silage before flushing, feed 1 pound of shelled corn on top of the corn silage for the first 3 days to increase palatability of the silage.

herds where a multiple-farrowing practice is an additional problem. The heat of the summer seems to reduce the ability of the sow to get-with-pig. We can't say whether this is the result of the sow or the boar. But, in planning late fall and early winter farrowings, additional sows have to be bred to compensate for the prop in the percentage of sows that will farrow — if you wish to farrow enough litters to keep your equipment filled to capacity. Though the sows in 1955 fed corn silage had a higher conception rate than the 1954 sows, factors other than corn silage also may have contributed to the difference in the two years.

Quick Guide

- Start feeding corn silage at least 3 to 4 weeks before or immediately after breeding.
- Use only high-quality silage cut short and ensiled while the plant is green.
- For best results, use one of the ration formulas outlined in table 1.
- Feed corn silage as outlined in table 2. With the start of rapid fetal growth—about the eleventh week of gestation—the level of proteins, vitamins, minerals and energy must be increased by increasing the amount of corn silage balancer as indicated.
- Failure to increase the level of corn silage balancer during the last 4 or 5 weeks of gestation may produce undesirable results. A shortage of B-vitamins such as riboflavin, pantothenic acid, niacin and vitamin B^{12} during gestation, for example, may result in hypoglycemia in the baby pigs.

New Way to Figure When Corn is Ready to Dry

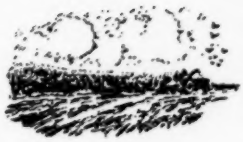
Here's an easy way to tell when your corn is ready to artificially dry, say agricultural engineers with the U.S.D.A.

Suppose your corn is just beginning to dent. This occurs at around 60 per cent moisture. Through the dent stage (60-50 per cent) the kernels reduce in moisture at about 1.2 per cent a day. This takes about 8 days.

From 50 down to 30 per cent the kernels lose moisture at ¾ of a per cent a day, *regardless of weather conditions.* This requires another 27 days. Altogether it will take about 35 days for your corn to go from early dent stage down to 30 per cent moisture — the point where you can start picking to artificially dry.

—U.S.D.A.

Silage is Heart of Cut-cost Cattle Feeding



This Nebraska farmer cuts all his corn for silage . . .

Condensed from Nebraska Farmer
Dick Coffey

SILAGE is the bread-and-butter for cattle in the Willis Ahrens' feedlots.

For the past three years this Burt County, Nebraska, farmer has cut all of his corn for silage. He has 85 acres of corn and none is used for grain.

This practice has paid off, too. Ahrens' cost per pound of gain on silage, which represents the major portion of the fattening ration, has been 16-18 cents. Before he switched over to this type of ration, the cost per pound of gain on a ration consisting largely of corn was approximately 24 cents (corn was $1.40 at the time). These figures include the complete ration.

The first 75 to 90 days in the lots really tell the difference, Ahrens says. "That's when you really save."

Ahrens, who keeps approximately 1,300 head of Sandhills and Montana-bred cattle on feed the year round, buys heifers at 500-600 pounds; steers at 600-800 pounds.

Ahrens converted a centrally located old horse barn into a feed storage building with overhead bins. After silage has been put into the power feed wagon by a manure loader, Ahrens drives the feed wagon into the driveway of the storage barn and fills it with corn and supplement by doing no more than releasing several levers. Molasses is sprayed on after the wagon has been filled.

He starts the cattle on five pounds of corn, all the silage they can eat, which varies between 30-35 pounds, and two pounds of chopped hay, and one pound of supplement. He does not feed enough silage to make the cattle go off-feed, but lets them feel their way around until the lot is started good.

After two weeks on this ration, Ahrens adds one pound of corn every other day for approximately two weeks or until the cattle are getting 12 pounds of corn per day.

The last 50 to 60 days in the lot, he increases the corn up to

Reprinted by permission from Nebraska Farmer, Lincoln, Nebraska

18-20 pounds, depending on the size of the cattle. This amounts to a 5:1 ratio, five pounds of corn to one pound of hay.

Ahrens figures his gains at two and three-quarters to two and seven-eighths pounds per day. He sells the heifers at 850 pounds; the steers at 1,000-1,150 pounds.

Ahrens also feeds alfalfa silage and some oat silage. Last summer he bought 300 acres of alfalfa and 100 acres of corn for silage.

He uses no preservative, but wilts the silage for several hours after cutting. He has four silos, three trench and one upright. Trench silos hold 2,100 tons; upright, 200 tons. The four silos are usually full by fall.

For seven weeks last summer, he fed chopped green corn out of the field, primarily to cut costs. The corn has more vitamins, he says, and has to be handled only once.

The 305-acre Ahrens farm, which is one and one-half miles north of Oakland, has 100 acres of alfalfa, 85 acres of corn, 56 acres of oats and 64 acres of pasture.

Ahrens rounds out his livestock operation with approximately 300 feeder hogs that run behind the cattle during the winter and fall. The hogs are put on alfalfa pasture in the summer.

Alfalfa Produces Better Growth and Reproduction

For a more profitable cow herd, feed just enough alfalfa to take care of necessary carotene requirements.

That's what Ford Daugherty, associate animal husbandman of the Colorado A & M Experiment Station, has found during the past 10 years of testing vitamin A on experimental lots of cattle.

"We found alfalfa produces a better growth and a better reproduction picture than vitamin A. However, vitamin A does as well in milk production as the carotene in alfalfa," Daugherty said.

Weaning heifers were purchased in 1946 for the experiments, and except for replacements, the same cows have been used throughout the tests.

Five experimental lots of cattle were tested. The two lots receiving alfalfa in their ration showed the best results. They conceived better than the other lots and had the highest percentage of calves. Calf weights for both groups were very good, Daugherty said.

Feeds used in the different rations were cane fodder, soybean oil meal, vitamin A oil, alfalfa hay, dehydrated alfalfa and pasture.

—Colorado A & M College

Quizzing the Forage Expert

One of the country's leading authorities on forage and grassland farming is questioned by three men, including a farmer and a Farmer's Digest editor . . .

Condensed from Farm Quarterly

Grant Cannon

This is an interview with Maurice E. Heath, co-author of "Forages," Associate Professor of Agronomy and Director of the Purdue University's Southern Indiana Forage Farm. Mr. Heath was questioned by Don Fisher, of Conner Prairie Farm, Noblesville, Indiana; Al Haller, Livestock Editor of Farmer's Digest, Fort Atkinson, Wisconsin, and Grant Cannon, Managing Editor of The Farm Quarterly. Here are their questions on Grass Farming. The answers point the way to more profitable livestock feeding.

Q. Mr. Heath, can we set up some standards first? What would you call a good forage crop?

A. Well, I'm thinking of high quality forage in terms of 7,000 or 8,000 pounds of milk per acre, 500 pounds of beef—more than that where you complement forage with corn—and 700 to 800 pounds of pork per acre.

Q. Do you happen to know what our average returns on forage are today?

A. Well, Miller-Purdue farm where they have been . . .

Q. That would be a little better than average, wouldn't it?

A. No, I'm thinking of their unimproved grass. They get about 100 pounds of beef per acre. And the Southern Iowa pasture farm gets about 95 pounds of beef per acre on the unimproved pasture. There are lots of pastures considerably below that figure. In contrast to this we feel that on land capable of producing 100 bushels of corn, we can think of four or five tons of alfalfa hay or its equivalent for forage. The real kick in forages comes when you supplement the forage with some energy-giving food such as corn or other grains. You are then making up for the deficiency in grass and you're also making up for the deficiency in the corn or grains.

Q. You would then get more

Reprinted by permission from Farm Quarterly, 22 East 12th Street, Cincinnati, Ohio

than you would from either alone?

A. Yes, the protein and energy feeds supplement each other.

Q. What major changes will we have to make to move the production level from 100 pounds of beef to 500 pounds per acre?

A. Well, there would be soil treatment to make it possible to grow these high forage yields; then there would be selection of the legume-grass combinations that would respond to the treatment; and then the utilization management of that mixture to get the most out of it.

Q. Let's get back to the soil, what would be your first step there?

A. On any soil we have to have an inventory. We should test the soil and get an indication of the availability of phosphorus, potash, and lime that is already in the soil and find out how much we are going to have to add to bring it up to the level that will produce the kind of pasture we mentioned.

Q. And what will that level be?

A. To get maximum production of alfalfa or alfalfa-grass mixtures, it should be at least 200 pounds of available phosphoric acid and perhaps 250 pounds of potash with a pH of somewhere around 6.5 to 6.8, or even up to 7. Then with high production you may even have to come back and supplement between harvests with potash. That is where you are removing the crop for silage. Where you are feeding on the crop, potash and phosphorus is remobilized through the season, going through that animal back on to the land and through the plant again several times.

Q. Would you plan to grow all your nitrogen into the soil or is there a place for commercial nitrogen in the forage program?

A. There is one hazard, and it is a real one—bloat. So far the only practical solution has been to encourage more grass at least up to half of the mixture, and beyond that if you are still having bloat trouble. Current research would indicate that there may be a big place for the use of commercial nitrogen on some of these medium-tall grasses.

Q. The nitrogen will favor the grass?

A. Right.

Q. If you have bloat even under a program of 30 per cent legumes would it be feasible to go to grass alone with fertilizer?

A. That would be the next step, and use high nitrogen fertilization with frequent application.

Q. On the use of fertilizer, let's say I've bought a farm and have to have some kind of return if I am going to pay for it. Where

would I get my largest money return for each bag of fertilizer, by putting it on corn or forage?

A. With government supports and an imperfect market, I'd say for corn. My advice would be to go heavy on the corn in the early years of payments and work your program to shift over to the forage side once you've got rid of your obligations and could work into enough animals to utilize your forage production. Your investment is going to be much heavier on the forage side than it would be on corn if you sell the corn.

Q. Because you have to invest in animals to utilize the forage?

A. Yes. And always have a lag with livestock between production and sales.

Q. Would you advocate going to an entire forage program?

A. No, I would be the last to say that an area or a farmer should go 100 per cent forage. The best use to which we can put our forages or sod crops in the corn belt is in a complementary relationship with our grain crops.

Q. Getting back to the bloat problem, does the daily cutting and hauling of the pasture to the feedlot—zero pasture, I think it's called—eliminate bloat?

A. It does help to reduce it, but it isn't fool proof. One thing that helps is that farmers have their livestock where they see them more often than they would in the pasture and they are also able to supplement their legume pasture with hay or some other type of dry material where they have them in the lot.

Q. Would you say that we are going to a complete mechanical harvesting of forage?

A. Well, there seems to be a trend that way, but from the standpoint of efficiency and the role of the animal as a fertilizer spreader, I think we've got to use those animals to harvest the forages. Under high production we may have to turn to rotation grazing or ration grazing, where you allow them into an area that they will clean up in a day. And I should say that there is a good possibility of combining the grazing and the mechanical harvesting to help control the stage of growth at which the forage is used and so get the best quality forage we are able to produce.

Q. Now you are throwing in a new concept here, that of quality. How does a farmer evaluate the quality of his hay or silage?

A. How does he evaluate it? Well, one way would be intake—how much the animal would consume. Dr. Lundquist had two sets of animals out here in the dairy; he had one 1400-pound cow that got up to 180 pounds

a day of silage intake. Over a 120-day feeding period she gained 1.4 pounds per day and she gave an average of somewhere between 35 and 40 pounds of milk daily. Now, this was all silage that she ate, but it was made in the high protein state with about 50-50 legume and grass—ladino and alfalfa. It shows the quality potential. See?

Q. Along that line, one of the ways we are going to get quality is to put up our forage at the right time—is that right?

A. Well, what we are striving for there is a high protein, high sugar material, and stage of growth determines that largely. It would seem that is the pre-bud or boot stage of the grasses and the bud or pre-bud for the legumes like alfalfa. Now in Ladino clover I think you have more leeway, although Ladino by itself is kind of a wet mass and therefore we need a lot of grass with it.

Q. In order to get the most out of your forage, then, it would be wise to have an established stand of grasses that mature at different dates?

A. Right. With your winter annuals, your ryes will be your earliest; then wheat. I know of several farmers who are doing this with success. One that I go by all the time is using rye in March, and following that he is coming into his orchard grass-alfalfa and then he is going from there into brome-timothy-alfalfa, and he has some oats he is going to ensile and then his sorghum and corn. He is using a combination for summer. This takes some advance planning.

Q. Is there a place for irrigation in this quality control?

A. If there is an abundant supply of inexpensive water and your operation is intense, I'd say definitely.

Q. Can you give us some of the other major factors that are going to influence quality?

A. Fertilization would be one; stage of growth, I think, would be another; and then preservation.

Q. Does stage of growth apply to any way you are harvesting, whether pasturing, cutting and feeding green, or converting to silage or hay?

A. Right. And preservation is whether you can maintain that quality. A promising new advance in preserving the quality is the use of plastic—making a silage pile and covering it with plastic which has a fruit-jar effect in excluding air and getting anaerobic preservation. And packaging is not necessary, therefore you don't lose a lot of the juices that we do in an upright silo or a trench where we have packed to

exclude the air. This spring all silage for the dairy unit of the forage farm will be in plastic-covered stacks.

Q. But packing is essential in these?

A. Not in the stacks covered with plastic drawn clear down to the ground. In the bunker-type silo you should pack it. You'd have to pack it if you drove over it. If you didn't drive over it and could exclude the air and cover it with plastic, packing it is not essential.

Q. When we pack silage I always assumed one reason was to push the air out, but you are saying that we can just stack it out in the open and cover it with plastic.

A. If you cover the edges of the plastic at the bottom of this stack to exclude the air—it is not essential to pack it.

Q. You are simply excluding all further air.

A. Your bacterial action will soon use up what little air and oxygen is in the mass.

Q. We know about upright and trench silos, but this is a new thing. I'd like to ask a few more questions about it. How large are these stacks?

A. Well, the experimental stacks have run from 10 to 20 tons.

Q. And costs?

A. With the upright silo our figures show about $1.50 per ton cost for storage; the bunker silo runs about 90 cents and plastic about 50 cents a ton.

Q. Is this plastic reusable?

A. Generally we do not feel it is reusable. It is possible; if a man is careful, under certain conditions it could be reused. We reused portions of it, divided it up and used it for covering equipment and things of that nature. To reuse it on the stacks we have this problem—we have it buried in the soil and in feeding out in the winter, that soil is frozen and tears the bottom edge.

Q. So your figure of 50 cents is on the basis of disposable plastic?

A. Yes.

Q. Do you feed from the stack directly?

A. We haven't, but there is no reason why you couldn't.

Q. What about keeping qualities when you remove the plastic?

A. You will get some darkening and deterioration on the outer mass, especially if you have a period of warm weather, but usually you get good silage coloring.

Q. Is it essential to cover the silage almost the same day that filling has been completed?

A. That is right. These changes

in decomposition and deterioration are very rapid and our goal is to make in one day what we can cover that night. And we are thinking of a 50 or 100-ton silage pile.

Q. Is 100 tons the limit?

A. I don't know what the maximum widths of the plastic are—I know we are getting it in 28-foot width and that should allow us to make a stack say 12 feet wide and 6 or 7 feet high on the side.

Q. How are you going to keep within this limitation?

A. We will use a grain elevator type of mechanism; pull it ahead and make one long stack. We'll probably put one man on the stack to level.

Q. The plastic material you use is what?

A. It's Polyethylene and the black has proven to be superior to the clear because there is less deterioration due to light; and the other thing is that the black absorbs the heat and you don't get the sweating under the plastic that you do with the clear.

Q. You say that you figure you will make a 100-ton stack in a day; that would take 10 days to make a 1000-ton silo. How are you going to maintain the quality when stage of growth is so important?

A. Well, you may be able through management to hold the growth of some of this through grazing.

Q. How about clipping?

A. Different combinations and different seedings. For example, we prefer to use rye with our winter annuals for our early cut and wheat or oats for a later cut to spread out our harvest and get this quality.

Q. We have been talking about getting the silage early; what about too early?

A. Too early—high protein and then you have a breakdown of acids and a type of fermentation which may be objectionable to the cattle and certainly will be objectionable to your wife and in the dairy barn. To be on the safe side on these high protein silages it would be well to use a preservative such as metabisulphite or a carbohydrate like ground corn.

Q. I was looking for an answer on how you could protect yourself and still get it as early as possible.

A. On our vetch-cereal type silage, we have been able to stabilize that high protein with the use of eight pounds per ton of metabisulphite. It is estimated that under the best preservation we will lose 10 per cent of our silage through fermentation loss.

Q. We have been talking a lot about silage; do you feel that

every farm on a grass program should make both hay and silage?

A. I don't think there is any good evidence that they should. Half a century ago it was largely hay and we've gone through a transition from hay to grass silage. If the quality of the silage can be maintained at a high level that is the next best thing to high quality pasture. Then there are the hazards and they are greater under hay making than under silage situations.

The level of the oceans rose about 4 inches between 1930 and 1950, according to a recent Government report. This is attributed to the warmer climate all over the world, melting huge quantities of ice and snow from the mountains, and from the polar regions.

Q. Hazards?

A. Particularly in the spring when we are getting these rains every few days. It has been estimated that in some states like New York, 40 per cent of the hay is rained on and a lot of it loses 50 per cent of its nutrients. Leaching is terrific.

Q. How about making the first crop into silage to avoid the hazards to hay?

A. Where hay is desired that is definitely better because we have our better hay-making weather in July and August.

Q. Do you feel that the reason we make hay is just habit?

A. Partially it is tradition—a habit. However, high-quality hay, we must admit, is comparable to high-quality silage in feeding. But one of the impractical things is owning two sets of equipment, hay making and silage making, and two sets of storage facilities. So, if you can adapt yourself to one type of harvest and preservation, you reduce your investment and intensify your operation.

Q. Do you feel that we are eventually coming to an all-silage program?

A. As our forage practices become intensified along with livestock specialization, I think that is definitely in the picture.

Q. Could the farmer handle the silage program cheaper than hay?

A. I haven't done any figuring on this, but I would say yes.

Q. In other words, he could produce 500 pounds of meat from this acre more cheaply by using the silage than he could by using hay?

A. I think he could do a better job because of eliminating some of these hazards that we talked about so that he could maintain the quality of his product.

What Is Your Pasture Worth?

Ever consider how much land a cow can harvest in a day and how much feed she can get?

Condensed from
Minnesota Farmer

A COW will graze about 1/16 of an acre a day. That is all she has time to cover with the width of her mouth and bite off the grass that may be there. The average cow will gather about 160 pounds of grass a day provided, of course, that there is that much on 1/16 of an acre. If the growth is less than that she will gather a correspondingly smaller amount. If she gets filled up with 160 pounds of grass there is enough feed value in it to satisfy the needs to maintain her body weight and produce 30 to 35 pounds of milk a day. If she produces more milk than that, some extra feed should be fed.

Pasture grass is fairly rich in protein. Only home grown grains should be needed as the grain ration to be fed on pasture. When the pasture tapers off, feeding hay or silage to make up some of the nutrient is advisable as they are cheaper than grain.

Many dairymen offer their cows some hay even on good pasture. It may help hold down bloat where that has been a problem and it also gives a cow a chance to get a fill of roughage on extremely hot days when she may not go out and get a good fill in the pasture. Some experimental work carried out at the University of Kentucky indicates that where cows have free access to all the hay they want they may not graze as much as they otherwise would since they apparently would rather stand in the yard and eat hay than go out and gather a fill of pasture even though it was available. Therefore, if you have very good pasture it may be well to not give the cows all the hay they will eat, otherwise they may be eating less pasture than desired.

Few things vary as much from farm to farm as the kind of pasture we have for our dairy herds. Some well managed pastures return real feed for the cow while some neglected "left over" areas considered pasture are only exercise lots during much of the summer.

Reprinted from Minnesota Farmer, 330 Midland Bank Bldg, Minneapolis 1, Minnesota

"Trench silos are not for me"

I "broke" my back and nearly froze to death trying to feed my cows out of a hole in the ground . . .

Condensed from Hoard's Dairyman

Harry F. Haskins, Pennsylvania Dairyman

MAYBE I have no right to complain, what with all the drought going on around the country, but out our way the weather went in reverse this past year. We never saw so much rain in our lives. Well, it was because of all this rain that I got into the trouble I'm going to tell you about.

Well, sir, April and May were about the wettest months we had had around these parts in many a year. We did manage to get our work done in between gully-washers.

By June, we still weren't thinking too badly about all the wet weather. The pastures were green and nice; the hay was growing tall and thick; the oats and corn were a nice dark green; everything was growing like weeds. No, sir, it made it kind of unhandy, but it didn't hurt a thing.

Rained Cats and Dogs . . .

By July, it was a different story, and I started to get worried. I had only a little bit of my hay made and every time I cut hay, it rained. When I raked, it rained. It rained after I turned it over and it rained before it was dry again.

By the time I tossed it back and forth, rolled it around the field, baled it, and flipped the bales to dry it, it was the neatest packaged bunch of kindling sticks I ever saw.

In August, it wasn't much better. Everybody was waiting for it to quit raining. The corn stopped growing and was turning yellow; oats were down; hay was overripe; and the wheat and barley slugged down in muddy fields.

Well, sir, that's when I decided to do something. I decided to dig a big hole and throw everything in it before I lost what I already had.

I got out all the pamphlets and circulars I had on trench silos and studied them so I wouldn't pull any boners. By the

Reprinted by permission from Hoard's Dairyman, Fort Atkinson, Wisconsin

time the man with the bulldozer came in, I had it all figured out. I picked a good location on stoney soil, near the barn. Yes, sir, I figured it all out real good. I had it made!

When the hole was finished, I was so proud, I called in some of my neighbors to take a look. Bill said he thought it was too deep and too wide. Henry said it was too narrow. Earl threw them all out of gear by saying it wasn't wide enough, deep enough, or long enough.

They all went back to filling their uprights with me wondering whether it was too long, short, wide, or deep.

By the middle of September, I had the hole in the ground almost full. One day near the end of filling, I was rushing to get as many loads in as I could to get the job done. I said to myself, "After the next load, I'll take time out to pack." That should be included in famous last words. The next load, the tractor, wagon load and all, almost sank out of sight. It took three neighbors, three tractors, and three days to get me going again.

When the job was finally done, I packed it down nicely and put lime over the top, just like the book said to do. It looked so pretty. The cows thought so, too, because the first time they broke out, they had to go over and see how pretty it was.

After awhile they broke out just to see the silo. They tramped all over it and lots of other things. I got purple in the face, but it didn't do any good. Every day, I spent half my time chasing those ornery creatures off the silo.

Pitched and Pitched . . .

In November, I spent a week fixing up a nice feeding gate to go into the trench so the cows could go in and feed themselves. When I had finished, my boy and I started to open the silo up. We kept a pitching and the spreader kept a going, and we kept a pitching. I didn't think we would ever hit anything the cows would eat.

Finally we did get back to where the smell wasn't so bad. We put in the rack and called the cows. Well, those four-legged buzzards took one look and I guess they remembered my purple face, because we couldn't even drive them into it. After while a few went in and then more. Then the fun began. I never saw so much pushing and shoving as went on that day.

After a week of such, I kept noticing that the same five or six cows were always in the trench and the others were all outside looking in. Not only that, but the mess!

We decided that wasn't any good, so we took out the rack and cleaned up the mess. After that, we backed a wagon in and load-

ed it and pulled it into the yard for the cows.

That went on for awhile. Only thing was that we didn't know what to do about the spoilage. We tried loading the spreader first with the top spoilage, then the wagon with the good stuff. We could only load the back end of the wagon, so we had to stop and pitch the stuff forward, and then load the back again. By the time we got through feeding silage, there wasn't much time left for anything else.

It was Cold, too . . .

In December, it started to rain again, cold and wet-like. We weren't too happy about staying out in that hole too long, so to save time, we started to pile the spoilage along the side. By the end of the month, we had just one big, sloppy mess.

When we dug the hole, like I say, we had it all figured out; all that is, except the windage. In January, the wind whipped through the trench 90 miles an hour. It was 20 degrees colder in that hole than anywhere else in the whole world.

We had to use a pick axe on the top to even get it started. By the time we got loaded, we were so numb that we couldn't move. Not only that, but every time it snowed, it just kept blowing in and filling the trench.

We finished the trench in February. Good thing, too, because another month and it would have finished us. After shoveling snow, pitching spoilage, and loading the rest, we were so sick of that thing, that we wished we had never seen it.

Early in the spring I have plans for that thing. I'm going to get that man with the bulldozer back in and I'm going to make that thing shorter, narrower, and shallower, until there won't be anything left but where it used to be. Then, I'm going to see the banker about going into debt for an upright. Trench silos—phooey!

Farmers' Net Incomes Slightly Higher in 1957

Demand for farm products is likely to remain at a high level. Consumers' incomes are expected to rise further. Some improvement in the general level of farm product prices is expected. The increase is likely to be small, with a continued heavy supply situation for most farm products. Larger receipts from livestock and livestock products are expected, with prices for farm crops to remain about the same as in 1956.

What Does A Mow Drier Cost?

If you have 25 cows and can't afford to lose even a part of your hay crop, consider the advantages of drying hay in the barn . . .

Condensed from Farm Economics

B. F. Stanton and M. P. Kelsey, Cornell Univ.

DURING the last ten years more than 850 New York dairymen have installed forced-air mow-driers in their barns to help them harvest and store high quality hay. To determine under what conditions a mow-drier is a good investment, a study of fifty of these driers was made in 1955-1956.

Actual costs of installing the different types and sizes of mow-driers on the fifty farms studied varied widely, $300 to $1,400. In most cases about 80 per cent of this cost was for the motor, fan and frame which is often purchased as one unit. Lumber and labor to build a duct system on the floor of the mow, and additional wiring needed for the motor and fan made up the rest of the original installation cost.

Total annual operating costs for these driers averaged $132 and ranged between $100 and $200 on two-thirds of the farms. The cost of mow-drying one ton of hay was $2.12 when an average of 62 tons was handled. More than half of the operating costs were for fixed items such as depreciation, interest and insurance.

Installation Costs

The most commonly used mow-drying system had a 36-inch fan and a five horsepower motor. Such an installation can handle about 900 square feet of mow-floor area efficiently if hay is not piled to a depth of more than twenty feet. This size of mow will hold at least 50 tons of chopped hay, or about 75 tons of bales.

TABLE 1—INSTALLED COST OF A MOW-DRIER
Using a 36-Inch Fan and Five H.P. Motor

	Installation costs, 1955	Expected costs, 1956-1957
Motor, fan and frame	$510	$575-$625
Lumber	55	40- 100
Wiring	60	35- 150
Labor	45	30- 100
Total	$670	$680-$975

The cost of installing this size of drier varied because of differences in the prices of the motor, fan and frame in the years they were installed and the amounts of farm labor and lumber used in building the duct system. Made primarily between 1950 and 1954,

Reprinted from Farm Economics, published by Cornell University, Ithaca, New York

the average cost for such installations was $670 (table 1). Estimates of the cost of installing such a drier in 1957 ranged from $680 to $975. This $300 range represents the extremes of a farmer who builds the duct system himself from lumber produced on the farm and who needs little additional wiring, to the man who hires the whole job done involving purchased lumber and carpenter's wages.

Operating Costs

Annual operating costs for a drier, when installed, vary somewhat depending on the amount of hay handled on the system. Fixed costs plus repairs equal approximately $90 per year. Power requirements vary both with the amount of hay dried on the system and the relative humidity of the air during the drying season. In 1955 drying conditions were excellent, and the average cost of electricity was $0.85 per ton. If electricity is charged at the 1955 rate, total operating costs at half capacity would be $118, and at near capacity about $150 (table 2).

TABLE 2—ANNUAL OPERATING COSTS FOR A MOW-DRIER

Using a 36-Inch Fan and Five H.P. Motor

Items	35 tons	70 tons
Depreciation, 22 years of life	$ 34	$ 34
Interest @ 6 per cent	45	45
Insurance	2	2
Repairs	7	10
Electricity @ 85¢ per ton	30	60
Total cost	$118	$151
Cost per ton	$3.37	$2.15

Estimates for a Larger Drier

Similar estimates of installation and operating costs were made for a mow-drier with a 42 inch fan and 7.5 horsepower motor. It handles about 85 tons of chopped hay or 115-120 tons of bales on 1,250 to 1,300 square feet of mow area. At the present time such a drier costs from $900 to $1,300 installed. Annual operating costs amount to about $180 if used at half of capacity, and $230 when curing 100 tons of hay. On a per ton basis this would be $3.58 and $2.31, respectively.

Conclusions

Hay can be brought in from the field one day sooner if placed on a mow-drier than if left to cure in the field. This reduces losses from weather damage and allows farmers to harvest a higher proportion of their hay in June and early July. This is important because feeding trials clearly indicate that early-cut hay produces more milk than late-cut hay.

The question facing the farmer is, "Will the cost of installing and operating a forced-air mow-drier be paid for in savings of feed or increases in milk production?" When the common sizes of mow-driers are used at or near capacity, operating costs equal about $2 per ton. In other words, a farmer must decide whether he can save sufficiently more hay

of high quality or increase the feeding value so that the mow-drier more than pays the $2 per ton operating costs.

To use a drier at or near its capacity a farmer must harvest enough hay for 25 cows and their replacements. If he is one of the fortunate few who is already harvesting most of his hay early in the season without weather damage, a mow-drier will not pay for itself. A man who harvests a large share of his early hay crop as grass silage may not have sufficient use for a drier. However, with 25 cows or more, any dairyman who is often short of roughages and cannot afford to lose part of his hay crop, should seriously consider installing a mow-drier.

A Farmer's Prayer

By Samuel R. Guard, Editor of Breeder's Gazette

Nothing Wrong, Our Father and Our Landlord, When We Halted our humming combine on the far corner of the field.

We only wanted to bow our heads and whisper to Thee our thanks for Thine endless bounty.

We pray for the sound of abundance of rain here at Lammastide, oh God.

Loaf mass! Feast of bread? Surplus or not, we heartfully praise Thee for this plenty—which we would share, whereever children hunger, mothers starve, or grown men grit their teeth on nothing.

Bless us at the bright harvest of show ribbons too, oh Lord.

Make us humble if we win, lesson-learning if we lose. For Thine be all the glory, now and evermore.

Amen . . .

New for You . . .

THE EDITORS

Johnson Grass must go — Spot treatment using Dalafon will completely eradicate Johnson grass reports George Clark, Extension Agronomist of the University of Arizona. Applications cannot be "by guess and by gosh." It is essential that directions be followed exactly. Dalafon is a systemic; the plant carries the chemical down into the root system, thereby killing through starvation.

Let the Sun Shine Nellie and keep the cows at home. Sun energy is being harnessed to operate an electric fence charger by a Purdue University Agriculture Engineer, G. W. Isaacs. Silicon solar cells, located in a frame on top of a conventional fence charger, collect radiant energy from the sun and convert it directly to electrical energy. When the sun doesn't shine, a nickel-cadmium storage battery charged during sunny days takes over. It still costs too much, but manufacturing methods and continuing research will someday make it practical.

Poison the Forage but not the Cow—Phosdrin is highly effective in fighting the spotted alfalfa aphid and will not harm cattle eating the treated forage nor leave residues in milk or beef. In a report from Wisconsin, no insecticide showed up in milk even for cows on the highest dose tested. Results were confirmed by radio active tracer techniques where phosdrin was found to be rapidly degraded and excreted in a few hours after feeding.

If 30 out of every 100 bushels of corn were lost farmers would soon act, but most farmers regularly allow feed nutrient losses during hay making of 15 to 30% which increases to 40, 60 and even 100% during wet weather. W. M. Myers, head of University of Minnesota Agronomy department reported also, "Most of the grass silage produced on farms is inferior in quality." Improve hay quality by "watching the weather forecasts and use haying methods that reduce the time in the field after the crop is cut." Hay crushers and barn driers are a real help with barn driers almost a must for dairy farms.

Grass Silage is another way to avoid excessive nutrient losses but it takes high quality forage to start with, air must be kept out, and some form of preservative should usually be added.

A simple gadget now will con-

trol preservative flow to a finger-sized stream as silage unloads. Made by W. W. Wolfe Brow Co., Ohio, to retail for $15.00.

Write to Agricultural Engineering Department, North Carolina State College, Raleigh, North Carolina, for plans to build a 14′ x 40′ platform that dries 450 bales a day and reduces fire danger. Hay value boost and extra hay saved promises to repay $3000 cost in three years.

Hay moisture tester — Fits on tractor exhaust stack and allows on-the-spot testing. A kit has small accurate scale, drying container and fitting for stack. Simply weigh the sample, heat with exhaust, weigh again and you can read moisture content directly. Clay Equipment Corp., Cedar Falls, Iowa.

Female snakes lay fertile eggs, even though they have not mated for several years.

Trench or Bunker Silage Unloader — Made by Sunflower Industries, Inc., Olathe, Kansas, it cuts forage out of bunker or trench silo and blows it into wagon or truck. Can be attached to tractor hitch or bought with side wheels. Operator controls rig from tractor seat, a real step ahead of a pick axe, pitch fork and grumbling hired hand.

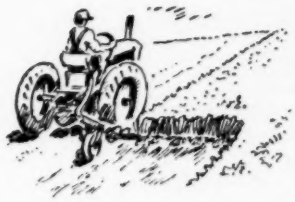
Now being imported into this country is the all-purpose machine known as the Uni-mog. Made in Germany, it is a truck, tractor, manure spreader — most anything you want to make of it. Equipment mounts on tool bars extending from front to rear.

Weigh Hogs and Fat Cattle the Easy Way. A new plastic tape from Canada works like the weigh tape DHIA testers use but "weighs" beef cattle and hogs. You simply put it around the animal, pull tight, and read the weight. Makers claim you can get hog weights accurate to one pound, cow weights to 10 lbs. Write Farmer's Digest for manufacturer's name and address.

High Yields and Profit

A starved plant will never return a profit. Real profit comes only with good yields. Good yields result from the use of good farming practices. And this includes having available the plant food needed by the plant. In most soils, much of this plant food must be supplied by the use of commercial fertilizer and lime.

How To Make Pasture Silage



One of North America's strongest and most vocal advocates of grass silage and bunker silos tells us how it is done . . .

Condensed from Production-Line Farming

T. J. Rutherford, Director
of Canada's Veteran Land Administration

I USE THE term "Pasture Silage" rather than "Grass Silage" in order to emphasize four things:

1. Good silage generally contains not only grass but legumes, and often annual crops used for grain or pasture.

2. Silage should be early-cut while grass and legumes are in the pasture stage.

3. Silage should be stored in such a manner that it can be self-fed.

4. On highly fertile land it may pay to self-feed cows from the face of the silo the year round.

We like to think of silage as something quite different in feeding value than the July-cut Timothy and Red Clover or overmature Alfalfa that so often goes into our tower silos in the name of Grass Silage, only to be laboriously fed out during the winter.

Ensiling Most Efficient Method

Ensiling is the most effective and least costly means of preserving forage crops in their lush green stage for winter feed, and of retaining the maximum vitamins, succulence, and palatability. Pasture Silage made from young grass and legumes stored in an inexpensive self-feeding bunker silo at the proper time, and well packed and covered so as to exclude air and rainwater, will retain to the feeding stage 85% of the feed nutrients in the growing crop from which it is made.

This percentage, because of waste from trampling, soiling, and over-and-under maturity is very much more than animals obtain from a like area if taken off as pasture. It is also very considerably more than would be retained to the feeding stage if the crop were made into field cured hay, when 75% is considered high; and if the material is rained on, 60% of the original nutrients is about the most that ever gets as far as the manger. The only method of curing and storage which is even comparable in efficiency to

Reprinted from Production-Line Farming Manual by T. J. Rutherford, published by Veteran's Land Administration, Ottawa, Canada

silage, is mechanical drying—which is, of course, many times more expensive and time-consuming.

Storage space required for Pasture Silage can be provided at less cost than that required for hay. If the work of silage-making is properly organized, using appropriate but inexpensive equipment, the cost of making and feeding silage can be as low as 50c per ton or $1.60 per ton hay equivalent. This is much less expensive than any other method of preserving and feeding forage. Silage stored in a self-feeding bunker silo is almost entirely safe from fire loss; while stored hay and barn driers constitute major fire hazards to farm buildings.

Advantages of Silage Over Hay

Lush spring grass can be made into silage at the right stage of growth with considerable disregard of weather conditions. This is probably the greatest advantage of silage over hay. Although a pound or two of hay per day in addition to Pasture Silage gives the same advantage as it does when fed to cattle on pasture, this advantage is too slight to warrant the additional work, equipment, and storage facilities required to make a little hay in addition to silage. Animals do not require the additional Vitamin D which is found in field cured hay if they are free to go outside in winter.

It is a fallacy to say that a cow's intake of silage is naturally limited by high moisture content. Cattle will still drink a great deal of water after eating their fill of silage, just as they will while on pasture—which contains even more water. However, silage that has been allowed to become soggy by rain is often made unpalatable, and cattle will eat less of it for that reason.

Basic Principles of Silage-Making

Pasture Silage is formed when stands of grass-legume mixtures, straight grass or annual crops that are surplus to pasture requirements in a Grassland Program are cut at an early stage of growth and stored in a large mass, where they can ferment and thus develop preservative acids in the absence of air. For this, certain conditions are necessary. To induce a good lactic fermentation (which is the one that produces most of the better preservative acids), conditions must be such that the mass will warm up to from 80°F. to 100°F., but not too much beyond this. There should also be a sufficient percentage of carbohydrates (sugar and starch) present in the material to produce the percentage of acid required to inhibit or kill, at the critical time, the micro-organisms producing the fermentation and any others that might produce mould or undesirable fermentation later on, particularly

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the slower-acting organisms causing the butyric acid fermentation which rots the silage.

When forage of any kind is ensiled, plant respiration continues until all the oxygen present in the air trapped in the forage is used up, leaving only carbondioxide and nitrogen. The aerobic fermentation which takes place during this period is accompanied by a rise in temperature, the degree of which is dependent upon the amount of oxygen present. If the material has a high moisture content and is filled rapidly into a tower silo, the pressure of the column of heavy silage tends to exclude the air very quickly and forces the juices of the silage into the hollow stems and other spaces that were occupied by the air, thus preventing the aerobic fermentation of heat. Under these conditions, even though there are sufficient carbohydrates present to produce a good lactic acid fermentation, this is largely prevented by the cold nature of the material. This permits the slower-acting butyric fermentation, which does not require heat, to carry on. This fermentation may eventually break down the silage, considerably reducing its nutritional value and giving it a very objectionable odor. On the other hand, where there is insufficient moisture in the forage, the mass in settling, is slower in excluding the air. This may permit temperatures to rise to a point which may kill the lactic acid-forming bacteria. The generation of extra heat also uses up considerable of the nutritional value of the silage. Although silage that has been overheated may come out of a tower silo in a palatable state, loss of Dry Matter and top spoilage are generally considerable. Never put over-dry grass in a bunker.

If I wanted to punish an enemy, it should be by fastening on him the trouble of constantly hating somebody.
—Hannah Moore

Methods Used to Regulate Fermentation

In order to control the fermentation in such a way that the desirable lactic fermentation becomes the dominant one, three methods may be adopted:

1. Wilt the silage and reduce the moisture content to approximately 70%. This is satisfactory if great care is exercised, but wilting is difficult to control and all too often the grass becomes too dry before it is stored. Wilting also adds an additional operation (which means more equipment) and will add to the cost of ensiling, as well as taking precious time when timeliness is so important.

2. Add extra carbohydrates such as whole or ground grain,

beet pulp, etc. These absorb some moisture and ensure that sufficient fermentable material is readily available. They give good results and add to the value of the silage by increasing its energy content. Where it is desired to supplement silage with grain in the fattening of cattle, this method is recommended in the case of high-legume silage where the nutritive ratio is high on the protein side and low on carbohydrates. However, it is somewhat costly if the nutritive ratio is already in comparatively good balance.

3. Some farmers prefer to partially sterilize the mass by adding organic or inorganic acids to stop normal fermentation and preserve the silage in a comparatively natural state. Of these acids, sodium metabisulphate is probably the best and most economical, but all are costly and add nothing to the feeding value.

The Bunker Silo

It would seem important, therefore to find some more economical method whereby direct-cut material can be stored without adding preservatives, and for this we now appear to have a reasonably satisfactory answer in the self-feeding bunker silo. In this silo, there is no heavy column of silage to contend with, since the silage is only five to seven feet deep and the compaction (being artificially applied by tractor, horses or truck) can be controlled. This makes it possible to regulate the amount of heating within the mass. Although moisture may be excessive at time of storing, particularly where the percentage of legume is high, considerable is given off from the larger surface during the period of aerobic fermentation while the silo is being filled. If the moisture is still excessive, it can seep out during packing and settling much more readily than from a tower silo.

It is important, when starting to fill a bunker silo, that not more than two and a half feet of material be put in before it has a chance to heat up. This heating, once well underway, can be controlled by packing with a tractor and adding more green material each day. *Packing should be such as to give a morning temperature, six inches below the surface of the silage, of between 80° F and 100°F.*

Another important consideration is that the mixture contain about 50% of high-carbohydrate grasses in order to balance high-protein legumes. A half-and-half mixture makes the best silage, but young grass alone requires less care in making. However, even straight legumes ensiled in this way come out very much better than they do from a tower silo. With straight legumes, either 100 pounds of grain per ton of silage

or, but not together with, about eight pounds of sodium metabisulphate per ton fed into the forage harvester in the field may well be a paying proposition, particularly in the bottom half of a bunker to ensure against offensive odor and add to palatability. However, this is seldom found necessary.

As the silage in a tower silo settles, there is a tendency for the silage on top to loosen up. This requires regular tramping over a long period. In the self-feeding bunker silo, the drop during settling is not so great. However, compaction with the tractor should be continued for a period each day for about eight days after filling is completed to ensure that the density of the silage at the top is much the same as in the bottom. Silage made in this way between the walls of a self-feeding bunker silo, and of young material with normal moisture content but preferably shredded rather than chopped, should be quite good and have little spoilage even if not covered. If well packed and covered with four to six inches of sawdust, which takes up and gives off rainwater before it reaches the silage, the surface loss should be negligible.

Find enjoyment as you travel along life's way. It is foolish to wait until you reach the heights before you view the scenery.

The silo may also be covered with a plastic film. This costs about 10c per square yard, and comes in large rolls six feet wide and three mills thick. Overlapping strips may be laid across the silo and held in place by ropes drawn tightly down each side close to the wall. The top of the silo should be left high in the center so that water will run to the sides. If possible, it should also slope slightly to one or both ends so that water can drain off to the ends along the groove formed by the rope that holds the plastic cover down. A 3M plastic is now available for bunker silo covers. It comes in large sheets up to 28' x 100'. While this is heavier and better, it costs about $60 per sheet but, with care it should last for several years. If transparent plastic is used, it should be covered with a little straw or sawdust. If a plastic cover is properly used, it will prevent spoilage and keep silage from absorbing rainwater—which is very important.

Avoid Low-Moisture Grass

Grass of low-moisture content (below 65% if chopped and below 70% if long) should never be stored in a bunker unless well mixed with high-moisture material. If it becomes that dry during wilting, it is better made into hay

or bedding. But why go to the trouble of wilting grass when you can put it in direct, thus saving an entire operation, destroying grass-eating insects, and minimizing the field loss? A large, permanent self-feeding bunker silo can be built for about $1.00 per ton capacity, and you can save that much in two years in reducing filling and feeding costs. A large temporary silo without a floor can be built for 25c a ton—so why be without one?

Little Bad Silage Made Even by Amateurs

During the last few years, the writer has been in a great many silos of various types in all parts of Canada and some parts of the United States, but has seen very little bad silage. Most of the poor quality silage resulted from its being put in too dry due to overwilting or late cutting, or the putting of young grass in a tower silo at a high moisture content. Having had the opportunity of examining hundreds of samples and of hearing the men who put the silage up describe the many methods used, it is fair to say that while there was considerable variety both in appearance and odor, all but a very few of the samples were reasonably good. Preservatives were used in less than 5% of the silos visited, and the great majority had been filled without wilting. The only people who complained of foul odor were those who had put green, direct-cut material into tower silos, and some who failed to make hay due to wet weather and ended up by trying to make silage in a stack or bunker, adding water to make up for lost moisture—which, of course, didn't work.

Advantages Lie with the Bunker

Snow fence silos and stacks are wasteful and should never be used when a bunker is so easy to build. Some trenches work well if completely open at one end and in well-drained soil, but almost invariably they have a moisture problem. Tower silos, unless wilting is practiced and carefully done or costly preservatives used, are conducive to a butyric acid fermentation. The well-sited feeding bunker with a concrete floor that is six inches or more above grade to give good drainage, and covered with a six-inch layer of sawdust or a plastic film, seems to have the advantages and few of the disadvantages of the others.

Unquestionably, we still have a great deal to learn about making Pasture Silage. The field is wide open for the scientist and the farmer to develop even better and cheaper methods of preserving to the feeding stage the maximum nutrition found in the growing crop. However, even with the limited knowledge and experience we now have, the writer believes that *a greater percentage of the available nutrients*

in forage can be brought to the feeding stage and fed at lower cost per Feed Unit from a grass-legume mixture cut at the proper stage and stored without wilting or preservatives in a self-feeding bunker silo than by any other method, including pasture but excepting green feeding.

Although green feeding in the paddock—where the cows graze in the spring and where they can gather emergency and supplementary pasture—is gaining favor as a means of obtaining the maximum milk or beef per acre from high-quality pasture crops, there are some farmers who prefer to feed Pasture Silage the year round. While there is an approximate 10% greater loss between the growing crop and the cow with silage than there is with green feeding, there are advantages in work organization and in the constant availability of the same quality of feed that favor the year round use of Pasture Silage. This method of feeding may well become more popular. Silage feeding in summer may be carried out in association with a shaded paddock where the cows can supplement the silage with some green grass, and where they can spread their manure where it will not have to be gathered up after them. There is a problem with flies on the open face of a silo in the summer, but this is not without an antidote.

Cattle Buyer in Abilene

In the fall of 1869 I went back to Kansas to buy cattle. I was delayed one night and had to stop at Abilene. That night there were seven men shot there . . . There was a dance in the dining room that night. The girls came out of the bushes and the Texas boys had their spurs on. I told the landlord that I wanted to go to bed and he gave me the best room in the house, but when I went in, I found I was to occupy it with another gentlemen. This gentleman asked me where I was from. He said he never expected to be as near hell on earth as he was tonight. He told me he was from Baltimore, Md., and that he had come out to look at a tract of land on the south side of Smoky river. He said he was the presiding elder of the Methodist Church in Baltimore. I did not wonder that he thought this a hard place. I had hard work to make him quit talking so I could go to sleep.—*From "Life of Tom Candy Ponting,"* pp. 60-61, Decatur, Illinois, 1904. *Reprinted from Agricultural History.*

When Will Beef Cattle Prices Double?

Economists believe the beef cattle cycle reached its low in February 1956 . . .

Condensed from
The Western Farm Life

P. H. Stephens, Farm Credit District of Wichita

THE beef cattle business is going to be fun this next several years. Cattlemen will be producing and trading cattle on a rising market most of the time during the next five years. The low of this cattle price cycle was apparently reached a year ago in February.

The beef cattle cycle is now about 10 years long. It was longer a couple of generations ago when a major portion of our beef was produced from 3 and 4-year-old steers rather than, as currently, from long yearlings and 2-year-old cattle.

A look at the shorter-for-biological-reasons hog cycle will perhaps clarify the picture of the beef cycle. Hogs at above $25 per hundredweight in much of 1953 and 1954, the peak was $28 in April 1954, overstimulated pork production and resulted in $10 hogs in December 1955. In turn 10, 11 and 12-cent hogs 12 to 18 months ago resulted in a sharp curtailment of hog production and hog prices will hit $20 again in 1957. The hog cycle is also shorter than formerly because of the more rapid manufacture of hog meat and the lighter weight of hogs slaughtered.

Because of our excess production capacity, if any farm product rises to a profitable level it is soon over-produced and unprofitable. Our farm problem involves, primarily and basically, the problem of selecting the most feasible means of stabilizing and adjusting agricultural production to effective demand. (The demand for food is high and relatively stable. Both population and purchasing power trends are slanting upward.) Further, because of the rising percentage of cash costs in meat production, livestock cycles have tended to become more rather than less violent in their number, price and profit gyrations.

It is relatively safe to predict cattle cycles because cattlemen believe in free enterprise and

Reprinted by permission from Western Farm Life, Denver, Colorado

practice it. Cattlemen are using the same kind of economics and business practices that their fathers did 40 years ago. So we can be quite sure that the price and production reactions will be similar.

The cardinal principle of free enterprise is unrestricted competition. Every cattleman has the right to out-produce and undersell every other cattleman. Competition is now restricted in labor, in the utilities, in oil production, in basic crop production, in most Grade A milk production, in many industries, and in fact for the large majority of our people. Margins of profit and wage rates are maintained by decree, by contract, by gentlemen's agreement, and other means in most businesses. Price wars are infrequent now except in meat production and that war is continuous. The current period of less than average beef cattle prices is very similar to the one following World War I.

Who would have predicted in the early 1920's that beef steer prices would double—jump from $7 per 100 pounds to $15. They did by 1928, equal to the post-World War I peak. We are doing the same things now that will make beef cattle prices double in the next five, six or seven years. Beef cattle have sold at less-than-cost prices for four years now. We have shook out many of the little cattlemen and the young fellows who started five or 10 years ago and we have dented the big boys, some of them to the extent of a million dollars.

The value of all cattle on our farms and ranches in the USA dropped $7 billion between 1952 and 1957. Somebody had to take that rap and also absorb the operating losses in the meantime. The Federal Land Bank of Wichita is now lending more per month than it did per year in the early 1940's when agriculture was prosperous.

Some people think that the decline in cattle numbers last year was due to the drouth. Those people have not looked very far or very deep. If beef cattle were profitable, our drouthy cattle would have been taken last year to the areas where there was a surplus of hay and grass just as they were in 1953, 1954 and 1955. But 1,600,000 head stayed in town last year because of previous unprofitable experience. A decline in total cattle numbers in 1956 was past due, drouth or no drouth.

Financial losses in beef cattle operations in recent years have been nearly as large in the wet areas as in the dry areas. Cattlemen in the wet areas have handled more cattle and lost less per head because their feed costs were lower but their total losses have still been large. Some in the

drouth area have been lucky and handled only half their usual number of cattle and so they have not lost as much as some wet-area optimists.

Cattle numbers declined 9 million head between 1934 and 1938 and 9 million head between 1945 and 1949. A year ago I told the National Cattlemen's convention in New Orleans that cattle numbers would decline 5 million head or 5 per cent within five years. That was a conservative estimate of the current decline. We took 1/3 of that drop last year.

A psychiatrist advises parents to spend more time with their children. Maybe he's trying to drum up some more business.

After the next bottom in cattle numbers is reached and we are again in a build-up period, the rate of slaughter will perhaps decline 25 per cent below current levels. A rate of slaughter below average is the only way you can build up cattle numbers. Whether the rise in cattle prices during the next five, six, or seven years is 75 per cent, 100 per cent, or 125 per cent, will depend on a number of factors including the extent of the intervening cattle liquidation, the amount of the then current competition from hogs and broilers, the national income level and the amount of inflation that takes place between now and then. But we are definitely headed in that direction. Choice steer prices in Kansas City rose $8 from February low to September high last year and got up to the 1946-50 average during one week, the last in September. A $5 rise during the same period this year is a conservative estimate. The 1957 high could come earlier, or it might be later. Who knows? Choice steer prices rose $2.50 between mid-February and mid-March to $22.20 this year, $3 higher than a year previous.

Choice steer prices last year were above $25 for nine weeks from mid-August to mid-October because beef and other meat supplies were short. This was because $19 prices last winter did not encourage filling the feed lots. Declining cattle prices during this past six months and choice steers at under $20 in February have had a similar effect this year.

When fat cattle were above a quarter late last summer, the average of stocker and feeder prices was below 18 cents in Kansas City. Cattle feeders did not need over half of an $8 spread so they filled the Corn Belt pastures where grass was going to waste, the corn fields, the meadows. Soon these cattle were in the feedlot. Since last December slaughter cattle receipts have been heavier

than the flood of beef of a year earlier.

In January, 10 per cent more cattle were slaughtered under federal inspection in the USA than in January 1956. They were lighter and produced only 8 per cent more beef. Fortunately pork production in January this year was 14 per cent less than in 1956. Total red meat production during January under federal inspection was 2 per cent less than a year earlier and national income was 5 per cent higher. Therefore, choice beef steers averaged $1.01 higher in Kansas City in January 1957 than in 1956 and hog prices were up to 50 per cent, from $12 to $18. Otherwise, cattle would be selling for less today than a year ago. The last week in February, 19 per cent less pork was produced under federal inspection than in the same week last year. Total red meat production was down 10 per cent from a year earlier and beef prices turned upward even though beef production was still at last year's level.

Mrs. Mary Carney, Springfield, Mass., is 100 years old, has outlived all but one of her nine children.

With the continued cooperation of hog men and smaller beef receipts, fat cattle prices could rise substantially. There has been no incentive this past three months to put more cattle on feed except the memory of what happened last year. The U.S. department of agriculture reported 4 per cent more cattle on feed January 1 and also 4 per cent fewer steers in the January 1 inventory than a year earlier. Beef slaughter in January and February this year was at all time record heights. Lighter receipts for the remainder of this year and fat cattle prices will average higher in 1957 than 1956. Of that we can be reasonably sure. Whether choice steers sell for 25 cents or more will depend upon how many or how few come to town in the weeks and months ahead.

Good and choice steer calves averaged 41 cents per pound in April 1951 not because numbers were short, but because slaughter was low. Cattle prices today are not low because we have 56 cattle per 100 people but because slaughter is at the rate of more than 42 per cent of our January 1957 inventory. If we slaughter only 31 million head, 33-1/3 per cent of a 93 million head inventory, some year in the next five, six or seven, choice steer prices in Kansas City could be double the February 1956 low of 19 cents or the February 1957 low of less than 20 cents.

The ratio of cattle to people has been declining for four years now. Beef cow and heifer numbers have been declining for two

years. We now have 1,158,000 head less than in 1955. Total cattle numbers did not show an absolute decline until this past year with a break of 1,600,000 head. For financial reasons cattle numbers will continue to decline nationwide for another year or two at least.

People and cattle numbers usually go in opposite directions during the liquidation stage of the cattle cycle and that is where we are.

I know that cattlemen received 7 per cent less total dollars in 1956 than they did in 1951 for producing 83½ pounds of beef rather than 55.3 pounds. All the pleasure was in producing 50 per cent more beef and getting less money for it and therefore not having the income tax worry of five years ago.

Spray for Spittlebug

Spittlebug sprays are most effectively applied when spittlebugs are young and most susceptible, says Glen Lehker, Purdue University extension entomologist. Many clover and alfalfa fields can be improved by spraying to control the insects. Without spray, losses can run as high as 50%.

The spittlebug is an unusual pest. The young bugs surround themselves with foam-like spittle masses inside of which they live and grow. Their reason for doing this is not entirely clear but it is probably to control humidity and to protect themselves against birds and other natural enemies.

Spittlebugs have sucking mouthparts and in the process of feeding they inject toxins into the plant which causes abnormal growth including extreme shortening of the plant stems. It is not unusual for fields that have been sprayed for reduction of spittlebugs to produce double the tonnage of pasture or hay.

The preferred treatment, Lehker says, is heptachlor at 1½ pints of the 25 per cent emulsifiable concentrate—mixed with sufficient water for even distribution—per acre. Heptachlor will not leave objectionable residues and sprayed fields can be pastured 7 to 10 days later.

In past years BHC has been used widely for spittlebug control with excellent results. It's use, however, along with all other insecticides, is being reappraised under the amended federal food and drug law.

—News from Purdue

How About Oats for Silage?

You can double the value of this low-income crop by harvesting as silage or hay . . .

Condensed from
University of Minnesota Fact Sheet

Rodney A. Briggs

OATS have long been the major grain grown on Minnesota farms. Traditionally, however, they have been the lowest income-returning crop. Acreage of this crop has remained high because of its use as a companion crop in the establishment of legumes and grasses.

Many growers realize the inferior value of oats but have never had a good replacement. We now know that we can realize twice or more the value of oats by harvesting for silage or hay.

Silage made from oats or mixtures of oat and peas should not be considered a direct replacement for legume silage. Oat silage is higher in energy value than legume silage but lower in protein. Oats or oat-pea mixtures compare favorably with corn silage as a feed and, when they are properly supplemented, may be used by all classes of livestock. If you use oats for silage, you can use materials like chopped poor hay or corn stalks for bedding.

The benefits of using oats or mixtures of oats for silage or hay are many:

1. They make an excellent succulent feed.
2. Removing the oats as silage helps legumes and grasses get established.
3. The cost to produce 100 pounds of total digestible nutrients is about half the cost if the oats are used for

Tips on Oats for Silage

- **Grow late maturing varieties.**
- **Grow oats with peas for increased protein.**
- **Inoculate peas.**
- **Maintain high fertility.**
- **Cut oats in late milk or early dough stage.**
- **Direct-cut oats and chop short.**
- **Pack well; cover silo**

Reprinted from Agronomy Fact Sheet No. 3, published by University of Minn., St. Paul, Minn.

silage than if the same oats are harvested as grain.

4. Using oats as silage permits you to harvest corn as grain. At present values, your corn crop harvested as grain will be worth more than your oat crop.

Mixtures and Seeding

In most areas of Minnesota, peas in a mixture with oats return greater protein yields than oats alone, but the mixture may not increase total nutrient yield. The total value of oat silage is high with or without peas in the mixture, if they are harvested properly.

Peas in the mixture generally do best in northern Minnesota where temperatures are cool and moisture is high. In southern and western Minnesota it is better to seed oats alone unless mixtures can be seeded early and have cool growing weather.

Seeding method — Oats and peas can be seeded together. However, for uniform distribution in the field be sure they are mixed well before you put in the drill. If you seed the two at different times, follow the first seeding as quickly as possible with the second to avoid risks of injuring germinating seedlings. Always inoculate the peas.

Fertilizing

When oats are to be removed as silage, yields can be increased by applications of nitrogen either in the form of manure or commercial nitrogen. Base all fertilizer applications on a soil test and apply the nutrients needed. Because of early removal, lodging will not be a major problem, so rates up to 40 pounds of nitrogen per acre can be used.

Yields are variable — Yield of oats or oat-pea mixtures used for silage will depend on the weather, varieties used, time of planting, and soil fertility. Yields have ranged from as low as 3 tons per acre to over 14 tons per acre. Yields of 10 tons or more per acre are not unusual.

Here's a good rule of thumb to use when estimating yield: with good fertility, *for every 7 to 8 bushels of oats the field would have produced of grain, it will produce 1 ton of silage.* For instance, a field capable of producing 70 bushels of oats would yield approximately 10 tons of silage. Use this rule when estimating the number of acres needed to fill your silo.

On a dry matter basis, the protein content of oat silage varies from 6 to 9 per cent, while oats and pea silage varies from 8 to 12 per cent protein. Yields range from 400 to over 800 pounds of protein per acre. Peas contribute little to the total yield but do contribute greatly to the amount of protein.

Harvesting

Time of cutting is very impor-

tant — During hot dry weather oats pass from early milk stage to late dough stage in only a few days. The time of harvest under these conditions is extremely short. For maximum yields of feed nutrients, harvest when in the *late milk* or *early dough* stage. Cut when the kernels on the top of the oat plant are in early dough. (In oats-pea mixtures cut when the oats are ready.)

Too late harvest means low moisture content, and this makes it difficult to pack the oats so that air is kept out. Too early harvest increases the chances of sour silage.

The lowest official temperature registered in the United States — 70 degrees below zero — was at Rogers Pass, Montana, in 1954, says the National Geographic Society.

Earlier harvesting may be advisable when the weather is unusually dry, when early lodging has occurred, or when oats are badly infested with rust.

Harvest quickly — Oats or oats and peas can be harvested for silage many ways. Because moisture content may be critical for good packing harvest the crop by the direct-cut method or pick it up directly following the mowing machine. *Do not let it wilt if it is mature.*

Filling the silo — Chop the silage short for ease in packing. You can use any type of silo—upright, bunker, or trench. Take extra precautions to do an extra good job of packing to eliminate air quickly, and use a cover of sawdust or wet weeds.

Preservatives not usually needed — Oats ferment easily without a preservative when cut at the proper stage of growth. But when you cut oats at an immature stage (before blossoming), it is best to use a preservative or wilt to 65 to 70 per cent moisture to prevent souring.

Silo reinforcements usually not necessary — You don't need to add extra reinforcements on the silo if the oats are cut at the proper stage of growth. This is because the density of oat silage or oat-pea silage resembles corn silage more closely than legume silage, and corn usually requires no special precautions. But direct-cut oat silage cut very early more closely approaches legume silage in density and extra reinforcement may be necessary.

Other Small Grains

Any of the small grains can be used as pasture silages or hay, and all can be managed the same as oats for silage. However, oats or oat-pea mixtures are the most palatable as well as the lowest income-producing crop.

Best Time To Cut Your Forage

Careful timing of forage harvest can cut your feed bill. For a 30-cow dairyman, it can amount to $150 or more a month.

Condensed from Massey-Harris Farm Profit

YOU can lose as much as 15% of the feeding value of your forage by delaying harvest a single week. If you have to choose between cutting hay or cultivating corn, better let the corn wait. Chances are the weeds won't be as costly as the loss of nutrients from your forage.

Cows on test in Montana made only 85% as much milk on alfalfa cut at the half-bloom stage as when fed hay cut at the initial bloom or one-tenth bloom stage. Hay cut at full bloom lowered milk production to only 63%.

"The stage of maturity at harvesting is the most important single thing in determining the quality of roughage," declares Dr. J. Thomas Reid of Cornell University. "Not only does early cut forage have the most nutrients but cattle find it more tasty. They'll eat twice as much from a crop cut on June 1 as from a mid-July harvest."

College forage specialists in several states give their recommendations for the best time to cut the major forages below.

Red Clover

Best stage to cut this legume is three-quarter bloom. In Iowa tests, the most hay was put in the barn when both first and second crops were cut at full bloom. Actual yields were 2.8 tons at early bloom; 3.1 tons at late bloom.

As in all other forages, quality declines as the plant matures. Clover runs around 18% protein before bloom and drops to 12% near the full bloom stage. Cutting at three-quarter bloom is the best compromise between high yield and high quality.

Two other factors favor earlier cutting: (1) Leaves contain about two-thirds of the protein in clover. Early harvest saves more of them. (2) Early cutting aids the second crop and improves the chances of getting seed.

Alfalfa-Brome

Best rule is to cut when the legume is at its best stage for high quality. That means alfalfa in the tenth-bloom stage. The same general rule applies to other

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grass-legume mixtures, except when the stand is mostly grass. In that event start silage making when first heads are showing. Protein content before heading runs around 18%. It slips to 13% when heads are half emerged and to 9% when a quarter of the heads are in bloom.

Cornell's Dr. Reid measured total digestible nutrients of grasses and legumes at various stages and found that the loss of nutrients of grasses and legumes is about the same. He found that timothy cut on the same day as alfalfa has about the same energy value. TDN in both plants ran around 70% on June 1; 63% on June 15; 56% on July 1 and 49% on July 15. Those dates represent the vegetative, early head, full bloom and mature stages.

Alfalfa

Cutting at the early-bloom or one tenth bloom stage is recommended in most states. Alfalfa is high in protein at this stage and yields are good. Frequent cutting at prebud or bud stage cuts yields and will kill the stand.

When alfalfa is cut near the full bloom stage, it already has lost some of its leaves and even though perfectly cured and gently handled, much of the quality will be left in the field. Dr. Reid found that protein content of alfalfa was 18.7% in the vegetative stage; 14.5% at bud; 10.2% at bloom and only 6.4% at maturity. TDN in alfalfa fell off 3% per week.

Oat Silage

You have only 3 or 4 fleeting days to make top-quality oat silage. Cut oats in the dough stage just as the first streaks of yellow appear. In a few days oats will turn and are too dry to make good silage.

Oats can be excellent silage with more energy than legume-silage. Protein runs around 10%.

Wheat, rye and barley make excellent forage too, when cut early. On a Purdue experimental farm, wheat cut as heads were coming out of the boot made 10 tons of silage. Re-growth sprang from the tillers and another 3 tons were cut 60 days after the first. This early cutting helped the under-seeded legumes and they grew enough for a 6-ton cutting in mid-August. Yield for the year was 19 tons.

New Jersey tests showed that the dough stage was best for wheat, rye and barley. Adding vetch greatly increased protein content.

Fast gains and high milk production are the proof of good forage. In a Minnesota test early-cut hay was worth one-fifth more than late-cut hay as a feed for dairy heifers. The early hay had a feeding value of $47 per ton; the mature hay was worth only $39. Difference in gain was .4

lb. per heifer daily.

The quality you leave in the field must be replaced with expensive concentrates. Dr. Reid figures it would cost a 30-cow dairyman at least $150 a month in concentrates to make up the energy lost when forage is cut on July 1 instead of June 15. The difference between July 15 hay and June 15, would be nearly $250 per month.

Careful timing of forage harvest can cut your feed bill. Plan now to make silage or hay when you can catch legumes and grasses at the peak of their feeding value.

Buying Irrigation Equipment

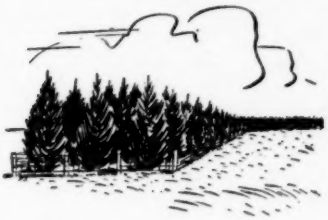
Irrigation equipment should be purchased with a great deal of thought and planning since the initial investment is high and, if used properly, irrigation means a rearrangement of the whole farm business, says Purdue University agricultural engineer, J. R. Davis.

Davis says each irrigation system requires good engineering design and selection of equipment if irrigation is to be a success. Farmers and farm managers who are considering irrigation have a right to expect the irrigation equipment dealer to furnish the following:

- An inventory of available farm resources, including soils, water supply, power source and availability of labor.
- A map of the fields to be irrigated with the layout of the equipment shown.
- A guarantee that the irrigation system will perform properly and will conform to standards of performance adopted by the Sprinkler Irrigation Association and American Society of Agricultural Engineers.
- An economic analysis of irrigation, including the cost of the system, labor costs, depreciation costs, operating costs, and other expenditures.
- Assistance in setting up and operating the equipment the first time. The dealer should also provide complete operating instructions and recommendations for improving crop practices under irrigation.
- Complete service and replacement parts inventory. This involves the selection of a reputable dealer who will take a genuine interest in the system and service needed.

—Purdue University

What Happens When Hay Isn't Cut on Soil Bank Acres



What will lodging, fire, disease, weeds, and rodents do to a good stand? Four agronomists give their ideas . . .

Condensed from The Farmer

FARMERS with land seeded to a cover crop in the conservation reserve section of the Soil Bank have an interesting time ahead.

What will happen to a crop now seeded, but not scheduled to be harvested in the years ahead? What are its dangers, or enemies? More specifically, since it is a soil "bank" crop, how should it be handled to put the greatest soil building deposit into that "bank"?

They'll have fun finding answers to those questions. Because, for the most part, all answers will be guesses. Seldom, if ever before has a crop been seeded that wasn't later reaped in some manner or other. There are few past experiences—and no known answers—on which to base decisions.

Agronomists in four Upper Midwest states, do have some suggestions, however.

Their man concern is with a potential danger—fire, and a normal enemy—weeds.

Control of weeds is the only restriction placed on cover crop management by Soil Bank regulations. County ASC committees can, when noxious weeds become a problem, force Soil Bank participants to control them. No payment is made for such control. Committeemen can also force reseeding when the original catch is not considered adequate, and when the fault lies with poor preparation or faulty management by the individual, rather than a natural cause, such as drought.

Other than that, there are no restrictions on what kind of cover crop is seeded, how it is managed, or how it ends up five years from now.

No grazing, haymaking, ensiling or other harvesting of Soil Bank crops is permitted. However, there is no objection to clipping rank growth and letting it fall back as eventual organic matter. In fact, clipping of small grain companion crops is required

Reprinted by permission from The Farmer, St. Paul 2, Minnesota

if those acres are not to be counted as Soil Bank base acres. Farmers who put in companion crops with their grass-legume seedings must clip the companion crop by June 30 to comply with base acreage requirements. If they do not, they may lose all Soil Bank payments.

Clipping of first growth is considered smart management by most agronomists, especially if both legumes and grasses have been seeded. "A heavy lodged first growth should not be allowed to accumulate," says James G. Ross, South Dakota State College agronomist. "Careful clipping should be practiced to keep weeds and nurse crop from crowding out or smothering the new grass-legume stand."

"Clip after small grain has reached the jointing stage," adds Rodney Briggs, University of Minnesota agronomist. "That will slow down annual weeds. Waiting until after small grain has jointed will keep it from stooling again and regrowing."

F. V. Burcalow, Wisconsin extension agronomist, suggests chopping and blowing back first growth after it reaches late bloom to early seed stage. "That would be beneficial to maintaining the alfalfa stand," he points out. Chopping would also do as much as any practice toward building organic matter and adding to the "bank" value of the Soil Bank.

"However," Mr. Burcalow also points out, "this practice costs from $3 to $3.50 per acre and I seriously doubt if we will see much of it done."

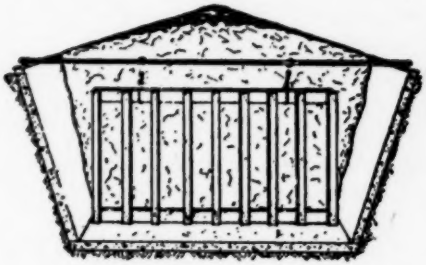
Where no nurse crop was put in, Dr. Briggs recommends clipping high—three to five inches—as weeds overtake the seeding. That will control the weeds and also favor the grasses in the seeding mixture. Cutting low favors alfalfa in the seeding. However, alfalfa should not be clipped before it reaches the bloom stage. Frequent clipping before bloom will kill it.

Where alfalfa is seeded alone and weeds are not a problem it does not need to be clipped. New growth will grow through old with no difficulty.

Where grass is seeded alone, it should not be clipped except as required to control weeds. "Seed it alone and let it alone," is the advice of the late John Sarvis, one-time agronomist at the Northern Great Plains Field Station at Mandan, N. Dak. "In most cases that still seems to be good advice," says Irvine T. Dietrich, North Dakota extension soil conservationist.

Where weeds are a problem, North Dakota specialists recommend clipping or chemical control. For large areas three-fourths to one pound of 2,4-D ester per acre will control any noxious weeds in that state.

Self-Feeding Silos Popular with Dairymen



A milk company's fieldmen talked to owners of self-feeding, horizontal silos. Here's what they learned . . .

Condensed from
Missouri Ruralist

DAIRYMEN are giving a vote of confidence to self-feeding in horizontal silos, according to a survey made by fieldmen of the Pet Milk Company in several states. Of 173 farmers interviewed, only 8 were not satisfied with their horizontal silos, according to L. L. Hunt, St. Louis, director of Pet's field department.

All but 42 of the 173 are self-feeding in their horizontal silos. And 20 of the 42 plan to self-feed this year (the survey was in 1956). Of the remaining 22, a dozen said they did not have enough silage, 10 said their structures were not completed.

There were complaints about self-feeding, too. Some said silos were too small for a number of cows. Some said there was too much waste. Others said animals did not eat well, and 3 said feeders didn't work. Self-feeding seemed to work best with good-quality silage. Boss cows were a problem for a few.

Of the 131 who were self-feeding, 104 used some type of self-feeding gate. Only 15 of these 104 had trouble with cows getting sore briskets. A change to hot wires or rods is planned by 5.

But of the 24 who used hot wires or rods last year, 3 will turn to something else. Power failures and wires breaking were troubles listed. Some eliminated wire breakage by wrapping barbed wire around the hot wire. Two dairymen were quite successful using plain barbed wire.

About one-fourth of the average family food budget is spent for meat.

It was generally agreed time is saved in self-feeding and in cleaning.

Steeper slope to the silo floor lessens cleaning time required, and many would increase the

Reprinted by permission from Missouri Ruralist, Fayette, Missouri

slope; 3 per cent is considered minimum.

Packing silage at filling time is of great importance—and only 8 of the 173 didn't pack continuously while filling; 4 of these will do it next time. A high percentage also packed for several days after filling.

In Long Beach, California, the proprietress of a pet store announces that she is now prepared to provide crickets for hearths.

Mrs. Ann Simington said she has laid in a stock of the cheerful critters. She is asking $1.98 a cricket and the price includes a bamboo cage.

She said crickets are not easily caught and that it takes a sharp eye to outwit them.

Top spoilage varied; as a rule there was more when silos were not covered but many thought extra spoilage was cheaper than a cover. All kinds of covers were used, 30 types!

A total of 78 did not use any cover but only 52 will not cover again. But 10 who covered said they will use none next time.

Here's a rundown on materials used and opinions:

Sawdust—19 used this, 10 will apply it again. A switch will be made to sawdust by 4 others, and 2 are thinking about it. Sawdust and paper were used by 12 and 8 will again. Sawdust, with rye or oats seeded in it, was used by 3.

Less than 1/6 of Scotland is suitable for farming.

Limestone—10 used limestone and paper, 7 will again and 4 plan to try it. Eight used limestone alone, and 6 will again, also 6 will try it.

Dirt—Only 2 used this.

Other materials used included loose straw, baled straw, hay, oats and fertilizer bags.

How to Prevent Ketosis in Cattle

A dairy specialist offers six recommendations for reducing ketosis in dairy herds:

(1) Cows should not be too fat at calving time; (2) they should get their fill of good quality roughage; (3) bring cows to full feed after calving and do it rapidly; (4) do not make quick changes in rations; (5) do not depend on molasses to prevent ketosis; and (6) any grass silage fed should be of good quality.

Broiler Nutrition in 1960

More synthetic ingredients, inexpensive man-made fats, cheaper antibiotics, and added flavor will speed growth . . .

Condensed from
Everybody's Poultry Magazine

John M. Snyder

WE HAVE seen some remarkable changes in automobiles in the past few years. Compared to changes in broiler feeds, however, these changes were mild. Look at the record. In 1947 broilers weighed 1.8 pounds at 8 weeks. It took 4 pounds of feed to produce a pound of broiler. Now broilers weigh 3 pounds at 8 weeks. It takes only 2.2 pounds of feed to produce a pound of broiler.

What can we expect in the future? In 1954 poultry nutritionists said we could get the broiler to go one-third faster than he was going then. They figured there was a thing called *biological maximum,* a kind of "sound barrier." Since 1954 we have almost broken through that barrier. In a recent Maine contest, 8-week-old broilers, mixed sexes, weighed 3.42 pounds on a 2.08 feed conversion.

Let's look into the crystal ball. One thing is certain. By 1960 we will have seen further improvements in broiler formulations. It will take less than two pounds of feed for each pound of broiler. Experimentally we have already accomplished this with eight-week-old birds.

What are the details? How will this be accomplished? Nutritionally the diet will be made more dense. More fat can and will be used. We can go up to 27 per cent fat in the diet and not hurt the bird. The things that stop us now are economy and pelleting.

The problem of economy could be licked with inexpensive, man-made fats. These would be short-chain, three-carbon oils. Eventually the biochemist may uncover the secret of converting cheap mineral oil into an oil that animals can use. Fantastic? Not nearly as fantastic as the atomic bomb was a few years ago.

At the same time the protein content of the diet must be increased. Even more attention will be given to the amino acid con-

Reprinted by permission from Everybody's Poultry Magazine, Hanover, Pennsylvania

tent of the protein. Nutritionists agree that methionine is the first limiting amino acid in modern feeds. They do not agree on the second or third limiting amino acid. Some say it is lysine, others say glycine. It could be tryptophane or arginine.

More Synthetics

We will see greater uses of synthetic amino acids. Even now methionine is being used more and more. At present, other pure amino acids are much too high priced to use. Technology will lower the cost. This will happen when the demand increases and the market becomes more competitive.

Until cheaper amino acids are available in pure form, the nutritionist must be very selective in his choice of feed ingredients. He will choose the ingredients that are rich sources of the critical amino acids.

The man formulating practical feeds will give more and more attention to the nutritional worth of the feed ingredient. He will look at fish meal, not as a feed ingredient, but as a package of nutrients. Nutrient analysis of the fish meal will be considered carefully. Each nutrient will be assigned a dollar-and-cents value. This value will be based on the cheapest source of the nutrient. At present, soybean oil meal is the most economical source of protein. Corn is the lowest priced source of energy.

As an example, let's look at the value of fish meal—based on current prices of nutrients. Per 100 pounds of fish meal, the protein value is $1.99. The energy value is $1.87. We will assign a value of $2.39 to the following: phosphorus, riboflavin, niacin, pantothenic acid, choline, vitamin B^{12}, methionine and cystine. (The methionine and cystine—beyond what is in the corn soya—are figured extra because these sulfur-bearing proteins have special value in modern diets.) The total nutrient value, therefore, of the 100 pounds of fish meal is $6.25.

May Be Worth More

In certain diets it's worth at least this much. In others it is worth much more. Additional value will depend mostly on whether or not the unidentified growth factor, sometimes known as the liver, meat or fish factor, is being provided by the fish meal. This can only be answered precisely by biological testing.

There is, of course, nothing new about the above method of calculation. Dr. H. R. Bird, of Wisconsin, and Dr. G. F. Combs, of Maryland, advocated the technique of feed ingredient evaluation early in 1955. By 1960, the method will be used much more widely.

The well-informed nutritionist will not be intoxicated by this

thing called "Partial Nutrient Worth." It has its limitations. A mixture of old shoe leather, properly ground, along with used crankcase oil, would give a feed additive packed with energy and protein. But it would be of no use at all for chickens. A little of it would kill them.

Unidentified growth factors are a fertile field of research for the chick nutritionist. In addition to the fish factor, we have yet to isolate and identify the alfalfa, whey and distillers factors. Synthesis of these, so we can add them in pure form, will help further to make our broiler feeds more dense and efficient.

The bob-white usually has only one brood a year, but it may contain anywhere from six to eighteen or more youngsters. They are hardly larger than big marbles.

It is logical, too, that our 1960 diets will contain added levels of minerals and vitamins. Trace minerals such as zinc, boron and molybdenum may be added to the list of trace minerals being used in practical diets. Already some laboratories have reported that these minerals are required for chick growth. Molybdenum in particular, is a controversial mineral at present. According to Texas work it is apparently required in purified diets if there is an abundance of sulfur in the water.

Practical broiler feeds already contain niacin, riboflavin, choline, pantothentic acid and vitamin B^{12}. These are added B vitamins. As our formulations are improved, and other weak links are strengthened, we may find that folic acid and pyridoxine are the limiting factors. These will eventually be added to broiler feeds.

Growth Inhibitors

We have indications that there are growth inhibitors in some feed ingredients. A growth inhibitor has been reported in alfalfa. This is a saponin-like compound. (Such compounds foam like soap when shaken in water.) Many plants contain saponins. It has been reported by California workers that cholesterol will overcome the depressing effects of saponins.

Washington State and Illinois workers have found evidence that heat processing of corn will aid chick growth. This processing may arrest the activity of an inhibitor. It has long been recognized that soybean oil meal must be "cooked." By 1960 we might be heat processing still other feed ingredients of plant origin.

At present, most broiler growers want arsenicals added to their feeds. Arsenicals step up growth. This seems especially true when secondary disease invaders are present. Routinely the "low level"

or "nutritional level" of antibiotics are being put in broiler feeds. High level antibiotics are used when clinical diseases strike. A furan compound is also used for the same purpose.

Speeches are like the horns on a steer—a point here, a point there—with a lot of bull in between.

Research Still Ahead

Research will give us more drugs, such as the arsenicals, furans and antibiotics, to be added to feeds. A compromise for "medium" level of antibiotics may be used routinely in feeds. This will happen when antibiotic manufacturers learn to produce huge quantities of their product on a mass production basis. Then antibiotic costs will go down. As a result the broiler grower will not need such a great margin of production improvement to pay for the added cost of the antibiotics.

Perhaps we will be making use of artificial flavors in broiler feeds by 1960. Cornell University scientists have reported that growing chicks prefer a butter flavor. This research answered "yes" to a question poultrymen have long asked, "Can a chicken taste?" The Cornell workers added the flavoring to the water.

Recently, liquid feeding has loomed high on the nutritional horizon. People get part of their food from the liquids they consume. They drink milk. They put sugar in their coffee. Chickens should benefit if they could "drink their food" as well as eat it. Sounds good, but there is one major drawback. Water soluble nutrients are expensive—much more expensive than the feed kind.

Still another fertile field of research is the use of hormones to stimulate broiler growth. In preliminary work at the Illinois Station, they were unable to get a chick response from the growth hormones. But rats and pigs have responded. Hormones act as a team. Too much or too little of one can throw the whole team off. By 1960 we will have learned much more about the hormones. We might be using the growth hormone by then. Already the producers of poultry meat have made widespread use of estrogenic hormones for fattening birds.

Many people have just enough religion to know which churches to stay away from.

The 1960 automobiles will have a lot of chrome, but there will be no frills on the broiler feeds. They will be stripped for action and powered for speed. Everything in the bag will be there for a specific purpose.

About Hay Crushers, Conditioners and Stem Crackers

Stems cracked by crusher dry faster.

Comments on the design and effectiveness of machines built to make better hay . . .

Condensed from Soils and Agronomy Information Letter

Rodney A. Briggs, Ralph F. Crim

FEW items of machinery are available to farmers to insure better quality of hay. It would seem apparent however, that one of the few, yet one of the best is the hay crusher. There are several machines on the market at the present time. Costs range from approximately $600 to $1500 for one of these machines.

The principle of these machines is simple. They attempt by mechanical manipulation to break the epidermal tissues of stem material so that the drying rate of stems more nearly equals the time of leaf drying. The University of Wisconsin has done extensive work in the design and evaluation of these machines.

The Bean hay crusher was the first production model on the market. This machine equipped with a mower bar, crushed immediately following cutting. This smooth roller crusher model was equipped with a pick-up attachment.

The Meyers hay conditioner was the second model released. It was pulled directly behind the tractor and had a pick-up feed that picked the swath that had been cut the last time around the field. This has a smooth roller type of construction. A new direct pull Bean model was released shortly after the Meyers.

Two years ago the Cunningham was released. This has a corrugated type of roller and the roller mechanism also serves as the pick-up mechanism. At present this is the least expensive model on the market. An improved model was put on the market in 1955.

From our own observations and the observations of others, the following comments are made:

1. All machines effectively speed up time of drying under good weather conditions.

2. 1957 models of crushers and crackers, roller and corrugated

Reprinted from Soils and Agronomy Information Letter, University of Minn. Extension, St. Paul

types, appear to be about equal in effectiveness.

3. Properly adjusted machines will not leave free juice running but will crack stems.

4. Drying time in good haying weather can be reduced 50% or more.

5. Reduction in drying time is important, however even more important is the increase in rate of stem drying.

6. These machines are equally valuable on second or third legume cutting as on first cutting because of saving leaves.

7. There is increased palatability of crushed hay over non-crushed hay.

8. There have been some reports of delay in drying time when crushed hay has been rained on. This apparently is true, however I've had conflicting reports.

9. Economic evaluation would seem to indicate that under an intensive livestock forage program these machines may have considerable merit.

10. In poor haying weather a crusher shows little advantage—suggest grass-silage.

Lambs Can Yield Good Return, Study Shows

Every lamb in a well-managed flock can return its owner almost $9 above feed costs, according to a recent study at the University of Minnesota's North Central School and Experiment Station.

In 1956, A. B. Salmela, animal husbandman, kept records on a flock of ewes and their lambs. Seventy-nine ewes produced a 138 per cent lamb crop. From pre-breeding until the lambs were marketed, lambs and ewes ate $12.63 worth of hay, silage and grain for every lamb marketed.

The lambs weighed 85-105 pounds each at market time, and brought an average total price of $19 per head. In addition, wool sales from the flock brought $2.50 for each lamb, for a total return of $21.50 per lamb marketed. Subtract the feed cost, and that leaves a return of $8.87 per head.

This return isn't all profit, though, because these figures don't include depreciation on buildings or other equipment, Salmela points out. But such returns do indicate that sheep can be a profitable enterprise on farms that have extra forage and pasture to be utilized, provided the farmer is able to raise at least a 130 per cent lamb crop, with lambs that weigh 85-90 pounds at 5 months and are finished sufficiently to grade choice.

That means that good management is still the key to successful sheep production, Salmela adds. —*University Farm News*

Can We Stop the Alfalfa Aphid?

We're mobilized and aiming all guns at the country's worst alfalfa pest . . .

Condensed from Farm Journal

THERE'S good news about the spotted alfalfa aphid. For the first time since it hit this country four years ago, the pest has been stalled on just about all fronts.

New insect enemies, fungus diseases, chemicals, resistant varieties and weather are all helping slow it down.

No one is counting out the aphid yet—it's the worst alfalfa pest ever. But this year's lull is giving us time to beef up controls.

In California, where ladybug beetles and small imported wasps have cut numbers in the southern part of the state, scientists are now carrying the predator fight into northern counties.

California scientists are also pushing the use of Systox to kill aphids without harming friendly insects.

Meanwhile, farmers in many parts of the west are seeding Lahontan alfalfa, the Nevada variety that resists the aphid.

In the South and Southwest where the aphid's attack fizzled during its favorite February-to-June months, scientists stepped up the fight.

"We're trying fungus diseases and imported parasites," says Oklahoma A & M scientist D. E. Howell. "We hope to be ready if it builds up again."

In North Carolina, a county agent's spray program helped check a build-up this spring.

Midwestern scientists are speeding up work on aphid-resistant alfalfa. Purdue University researchers have developed resistance in varieties that are adapted to the Midwest. Wisconsin scientists are selecting for resistance in their new Vernal alfalfa.

Farmers and scientists are coming up with better chemical control, too. Nozzle "drops" on high pressure booms, for example, force malathion or parathion sprays down into the alfalfa to get aphids hiding in the undergrowth.

New sprays using such chemicals as methyl parathion, Phos-

Reprinted by permission from Farm Journal, Philadelphia, Pennsylvania

drin and Thimet also look good in tests.

Scientists warn that the aphid could still flare up yet this year.

"Wet weather seems to be holding it back. But damage could still be bad if we get a dry, late fall," says Missouri scientist Stirling Kyd.

"A fall build-up could be disastrous in our 'alfalfa economy'," adds Wisconsin scientist John Medler. Fall infested stands would have a tough time surviving the winter.

Fence Post Home Treatment

The treatment of fence posts is never child's play. It's hard work, but hard work which pays off in longer-lasting posts.

The treating method called "cold soaking" is not especially burdensome, points out Ted Welchert, Arizona agricultural engineer. The cost is in the in-between class and the benefits seem to fall into this same class.

In this method, the wood is left to soak in pentachlorophenol, a chemical compound called penta, which gives the best penetration in the cold-soak process. The danger of fire is eliminated and the usable equipment is usually available around the farm.

Ready-to-use penta solutions can be obtained but it is cheaper to buy the concentrate and mix it with kerosene or light fuel oils. The directions for mixing will be found on the label and should be carefully followed. One gallon of solution will usually treat from two to four posts.

As for equipment, a stock tank or three oil-drum halves welded together make excellent horizontal tanks. For upright tanks, oil drums can be welded together end-to-end. If you use a stock tank, it must be thoroughly washed out after use.

The method is simple: just place the wood to be treated in the tank and fasten it down. The preservative is added and the posts allowed to soak for at least 48 hours. Then, take them out, drain them and dry in a shady place. When the wood is dry enough to handle, it is ready for use.

For various types of treatments and expected results, contact your county agricultural agent. —*University of Arizona*

Better Pastures and Hay with Irrigation

A few years ago irrigation was for truck crops only, now it is proving practical even for pastures . . .

Condensed from The Kentucky Farmer

IT hasn't been long since authorities were saying, "Irrigation just wouldn't be profitable in the South."

Experience made them change their minds, but until recently irrigation was recommended only for truck crops or "big money crops" such as tobacco. Now, studies are proving that irrigating pasture is a money-making venture, too.

For example, North Carolina experimenters reported 25 per cent more milk and a 52 per cent increased capacity from irrigation of Ladino clover-fescue pasture. Other states are showing similar results.

The farmer should realize that irrigation, in itself, is no cure-all for pastures and crops. It is merely a means to provide water to land at a time when it is needed. However, when the soil is capable of high production and water is available in sufficient amounts, irrigation can be highly profitable. The distance the water will have to be piped, the elevation of land between the water source and pasture, frequency of drought periods, and the available amount of water are all important factors to consider.

Involved, too, in making the decision to irrigate pastures is that they will require more water than most field crops. Also, irrigation is usually more profitable for pasture-grazing by dairy cattle than any other animals, for forage converted into milk has a greater value per acre than the same forage used to produce meat. Only the higher producing land should be irrigated, and recommended fertilizer practices followed.

The farmer should remember that the money invested in irrigation systems could be used to provide silos and silage or to buy additional feed for use when pastures are inadequate. This choice is up to the individual farmer but, in most cases, tests have shown irrigation to be profitable in the long run.

Better Hay Crops

Irrigation also results in more hay and better hay crops. Cuttings that might have been lost

Reprinted by permission from The Kentucky Farmer, Box 210, Middletown, Kentucky

during a drought give high yields when irrigated. Even during a summer when only short dry spells occur, hay yields have been as much as doubled by irrigation.

"When do I irrigate pastures?" is a frequent question farmers ask. Water should be applied often enough to prevent the grass reaching the wilting stage, in even distribution over the field at a rate no greater than the infiltration rate of the soil. It is very important to irrigate before the pasture becomes dry, because once the growth has been stunted, full recovery may be impossible. A moisture meter or a moisture pan of sheet metal is usually recommended to tell when to irrigate.

Need Expert Advice

One factor often overlooked by farmers planning to irrigate is the water supply. A creek may seem to supply all the water needed until irrigation starts. This is one reason it is so important to get the advice of an expert when making irrigation plans. On the average, from eight- to 16 acre-inches of water will be required for each acre of pasture irrigated during a dry year, at least six inches for other crops. An acre-inch is the water required to cover an acre to the depth of one inch, or 27,154 gallons. Remember, too, that the law says you cannot reduce the normal flow of a stream of water through your land beyond a reasonable rate. If a reservoir is needed, enough water for almost 50 per cent loss from evaporation, livestock, etc., must be allowed.

The farmer who attempts to do his own engineering when installing an irrigation system is making a mistake. What will work on one farm may be impractical on another. Each farm needs a different system. Dealers in irrigation equipment will give you an estimate free of charge. They will be able to figure all the factors unfamiliar to you. If a dealer installs an entire system, he must stand behind it.

The 1956 Social Security Amendments changed the optional methods farmers may use to report their income for social security purposes. Farmers whose gross income is as little as $600 a year can now report two-thirds of this gross income for social security. This means that thousands more low-income farmers can get social security protection.

Efficient pasture irrigation depends on a well-installed and well-planned irrigation system, but on good pasture and herd management practices as well. A combination of these will bring higher production and more income.

Which Feeding Program For Your Farm?

One man's meat may be another man's poison in the cattle feeding business. Here's help in picking the best program for you . . .

Condensed from
National Live Stock Producer

Rex Beresford, Iowa State College

WHAT is the best cattle feeding program to follow? That question is difficult to answer because one man's meat is another man's poison. Obviously, the best program is the one that makes the most money for *you.*

Under any set of conditions there are but two possible sources of direct profit in cattle feeding. These are *margins* or spread between the buying and selling prices and *feeding profit* obtained by putting on gain for less than it sells for.

Here are the basic factors which you must consider before planning feeding operations for a season, a year or longer period of time.

- The kinds, amounts and relative values of available feeds which you want to market through cattle.
- The time or season for which you plan to feed and market cattle.
- Your experience and skill in buying, feeding and selling.
- The capital available and the amount of risk you can afford or are willing to take.
- The availability and comparative prices of various kinds of feeder cattle.
- The outlook as to probable supply, demand and price trends as it appears to you.

After considering all these factors in their order of importance to you, flavored perhaps by your past year's experience, or personal likes or dislikes for a certain kind of cattle, that becomes your cattle feeding program. If you have given proper weight to all factors, you should come out with a program that is best for you but not necessarily good for someone else.

The first and most important factor in planning a successful feeding program is: What feeds do you want to market through cattle? Are you interested chiefly in finding a profitable market for good hay or a silo full of corn

Reprinted by permission from National Live Stock Producer, 139 N. Clark St., Chicago 2, Illinois

or sorgo silage? Are you concerned with utilizing pasture or corn?

Most successful cattle feeders get cattle to fit their feed and build their feeding programs around pasture and roughage supplies. Corn is an important but secondary consideration because you can usually buy corn.

Good feeders choose their cattle and adjust their feeding plans to fit the proposed marketing season. They may winter feed plain or medium cattle for the spring market. They may head Choice long-feds for the summer and fall and early winter in order to hit the best average seasonal market for each kind. Seasonal price trends are by no means infallible, but they are regular enough so that the feeder who goes with them invites the odds in his favor and he is right more often than he is wrong.

Careful Buying Pays Off

Shrewd buyers make money the day cattle are bought. Cattle that are bought right are half-sold. Less skillful buyers may be such good handlers that they are able to feed themselves out of a hole. Some farmers make their money by astute and intelligent marketing. The farmer who is proficient in all three factors—buying, feeding and selling—should have the world by the tail on a downhill drag.

The good feeder does best with better grade calves or yearlings where good feeding and management really count. The smooth operator who can buy and sell with the best of them may do better with quick-turn cattle if he can afford the risk. The comman or garden variety of feeder who mistrusts both his buying ability and feeding skill is fairly safe with common to medium cattle headed for the spring market if he has a lot of good roughage and corn or with better grade light cattle for the longer feeding period.

Cattle feeding risks vary with the weight, grade and kind of cattle. Usually there is less risk with calves or light weight Good to Choice cattle than with heavier grades. The note at the bank is smaller and the cost of gains are lower on light cattle—so there is more chance for a feeding profit. And there are more ways to handle calves than with most other cattle.

Plainer grades and yearlings cost less than the Choice ones, are fed more cheaply and for a shorter time, and usually involve less risk. Better grade short term heavy steers involve large investment and costly feeding. The profit or loss depends entirely on margin between buying and selling prices. When the going is good, such cattle are the most profitable. But when things turn sour, losses can be heavy. Only

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the man who can afford an occasional loss has any business with heavy cattle.

Yearling heifers for a short feed are only a little less risky than heavy steers except that first cost per pound and per head are generally less, so that less capital is involved.

The feeding of Good to Choice calves offers the most varied and flexible of all cattle feeding programs. Properly handled calves can be good users of pasture and high grade roughage. Calves make more efficient use of good feeds than do older steers. Their gain costs on comparable feeds are lower; their finished weights are most dependably popular with both packers and consumers.

President Eisenhower's Angus herd "isn't making any money now. He's buying cattle and not selling any," explains Brig. Gen. Arthur S. Nevins, Eisenhower's herd manager on the Gettysburg, Pennsylvania farm.

First cost per pound is generally higher but investment per head is less and so is total cost of enough cattle to use a given supply of feeds. But calves require good feed and plenty of it. They are poor scavengers and not good at roughing it. They need better lot and shelter conditions than are required by older cattle. The lighter the calves the more they need to be babied. Death risk is higher with calves, averaging around 1.5% compared with .9% for yearlings.

Only calves of Good to Choice or better in grade are suitable for feeding. Under normal feeding systems such calves can be made average Choice or better for the late summer to early winter market, generally a seasonably favorable time.

Heavy fleshy calves may be started on feed in the fall or early winter, gotten on full feed quickly and finished in drylot for the late summer or early fall market. This is probably the best system for calves that have been creep fed while with their dams. Lighter or thinner calves often are wintered on a full feed of good roughage such as legume hay, grass or oat silage or corn or sorgo silage and full corn fed on pasture the following summer.

Experimental trials of different wintering and feeding systems indicate that winter roughage should be supplemented with whatever is required in the way of grain and protein to produce winter gains of from 1¼ to 1½ pounds per day. Supplement requirements vary with the roughage used.

Full Feeding on Pasture

Such calves full fed corn all the way on pasture and given a 30 to 40 day drylot finish should

be Choice by October. Or they may be limited to a half corn feed for two months on grass—then full fed for November. If grass is good and plentiful and corn scarce they may be grazed without grain for two months, then full fed on grass and drylot finished for December or early January.In good pasture seasons, corn feeding may be delayed to the end of September and calves drylot fed for late winter.

Lighter weight calves — 375 pounds and under—require better winter care, more grain and supplement and use winter roughage less well than those of 400 pounds and up. Otherwise they may be handled the same as the heavier ones through the summer.

Heifer calves may be "worked" about the same as steers except that each phase of the program usually is shortened a month or six weeks and the heifers are finished from six weeks to two months sooner.

Yearling steers are equally as popular as calves among Corn Belt feeders. But a higher proportion are drylot fed. They fit into a winter feeding—spring and summer marketing program especially well. And they can use a roughage-corn feed combination well in a relatively short feeding period. One of the most popular and successful programs involves buying Choice or Good to Choice 650 to 750 pound steers in October or November, running them on the meadows and through the stalkfields until the dropped corn is gleaned and then starting them on a full feed of corn silage with supplement and a little hay.

Limited corn may be fed or corn feeding may be delayed as much as 80 or 90 days. Then full corn feeding is started and continued to the finish, usually another 90 to 100 days or longer. Such a program can be counted on to make Choice cattle for the late spring and early summer market. The chief drawback is that in some years there appears to be too much competition at marketing time. Many Choice grade feeder yearlings are started on full feed earlier or carried longer to high Choice or Prime grade for the summer or fall market. It is a program popular with men who take pride in topping the market and seems to work satisfactorily in all but the bad years. Costs and risks definitely are higher than those finished only to average Choice.

Yearlings Are Rugged

Many feeders prefer Choice light weight yearling steers to calves for summer feeding on grass. They generally are handled much as described under calf programs and with similar results. Their advocates prefer them to calves because they generally are more rugged, require less winter

shelter and care; can use more roughage in proportion to grain and average lower death loss. Sometimes they can be bought well under the price of calves of the same grade. But in recent years there have not been enough light yearlings to go around. Heavy yearlings do not fit such a program well.

Still another program popular with feeders with plenty of good winter roughage but short on corn is the feeding of Medum to Good yearling steers or in some cases heifers. Properly limited corn rations are fed until late winter, followed by 70 to 80 days of full corn feeding. This normally finishes such cattle for their grade sometimes from April to June, depending on their starting weight and condition and the feeding method. The plainer ones and poor doers can be sorted out in April or May and the top end carried to higher finish if desired.

If you are a dairyman and your milk production drops with green chop feeding the fault may be in the way you cut your forage. When cows graze, they consume the more tender, nutritious plants. If you go out and mow more mature, less nutritious plants and haul them to the feed pens, production is sure to suffer.

Probably the safest and most nearly fool proof of all feeding programs is the one using so called plain cattle. It is best suited to the small or inexperienced feeder who wants to use a lot of roughage and not too much corn. This is a low risk program. The lots can be empty by the time heavy field work starts. Marketing time jibes perfectly with seasonal price trends for such cattle. If sorted well enough at the start to throw out obvious counterfeits and poor doers, feeding efficiency and rate of gain will be about as good as with most higher grade cattle on similar rations.

First choice for such a program would be 650 to 850 pound Common to Medium steers. Medium heiferettes or Medium yearling heifers can be made to do on occasion but may have to be pushed faster to be out of the way before calves show up.

A typical schedule for such a program would be: Buy in late October or November, run in the stalkfields until corn is picked up, start on corn silage, supplement and a little good hay for 70 to 80 days, then full feed corn for the final 60 or 70 days and sell. Such a program is quite flexible insofar as feeds are concerned. Any sort of good roughage may be used. But more corn will have

to be fed where sorgo or grass silage or hay replaces corn silage. Protein supplements are necessary as with any other feeding system.

Margins Are Most Important

Low first costs, lower risks, cheap gains and taking advantage of the seasonal supply and demand situation in both buying and selling are the secrets of success with such a program. But in spite of lower buying price and cheaper gains, margins are of first importance with such cattle. They must be bought for less at the start because they sell for less at the finish and you get less per pound for the gains as well. Such a program rarely shows as good returns as better cattle in the good years. But then losses are never as great in the bad years. And the years when they turn completely sour are few and far between.

Feeding Programs Varied

Obviously not all possible feeding programs have been discussed. Many larger feeders, with equipment and lot space for handling different sets of cattle at one time, combine a number of programs shifting their operations in line with feed supplies and prices.

Burlap Jackets for Sheep

The sheep on several ranges in Wyoming have a new reason to look sheepish. They are not allowed to go out without their jackets on. These sheep, some 400 or more, are trying out several types of woven plastic coverings to protect their wool from snagging on bushes and from accumulation of sand and grime.

Perhaps the reason why other sheep look sheepish is because wool growers have come to recognize that as much as 40% of their crop may be wasted because of the foreign matter which clings to the sheep's coat until the wool has undergone its first cleaning, perhaps several thousand miles from the range.

Anyway, experimenters are working to see if Junior, who is growing the material for an overcoat for a man in Saginaw or Weehawken, cannot be persuaded to keep that material in better shape by wearing an overcoat himself. Sheepmen already predict that resin treated cotton or plastic coated burlap will eventually become fashionable as what the well dressed sheep is wearing.

—From the Christian Science Monitor

My Pond

You are sure to enjoy this story of a farmer who wanted and got a pond, economic or not . . .

Condensed from New England Homestead

J. R. Hepler

WHY was I anxious to have a pond on my farm?

Well, there were a number of reasons. In the first place, the pond site was a marshy, good-for-nothing piece of land, and then we needed water, and besides, we could use it for irrigation. These are really the official reasons for the pond. Then, too, they tell us that one can raise at least four hundred pounds of fish per acre in a pond, and that might be an inducement. But I truly think that the chief reason was—I just wanted to have a pond.

I have been damming the water of little rills and streams all my life. It was fun to build a dam when I was a kid.

This time, it took some time to decide what to do. A former student of mine in soil conservation work told me it would cost three thousand dollars to build the dam, which was more than my so-called farm was worth, and so the matter lay idle for about two years. Then the soil conservation agent in my district looked it over and said that they could build a pond for a lot less—a small pond, say about a quarter of an acre. Anyhow, I was going to hire a steam shovel to dig out a small waterhole at a cost of probably two or three hundred dollars. The soil conservation agent said I was foolish to do that because they could make a quarter-acre pond for a very little more and it would be something that I would be proud of.

Well, I told him to go ahead, but when the plans came back to me, they were for a half-acre pond. I was assured, however, that the price would not run much over seven or eight hundred dollars. I told them to go ahead. Apparently the digging was rather easy because my final cost of the pond, to my great surprise, was very little over four hundred dollars, and if I were well-to-do, it would be worth the four hundred dollars, and more, too, just to go out and look at it!

The pond was supposed to be filled by a spring which runs a

Reprinted by permission from New England Homestead, Springfield 3, Massachusetts

lot of water in the wintertime but promptly went dry during the digging operations. However, the bulldozer cut through four or five veins of water which started filling the pond, slowly but steadily. The soil conservation boys told me that it would fill up by April, but on December 15 it was flowing over, and the spring was discharging gallons and gallons of water again.

The pond has been useful. It was, perhaps, half full when we started drawing water out for cleaning seeds. Our little pump draws about 300 gallons an hour, and Peter, my son, wondered if we were lowering the pond very much by drawing that much water out. Figuring a quarter of an acre water space, an inch of water would hold, according to my way of figuring, about 8,000 gallons. I told Peter that I figured that drawing off 300 gallons an hour would not lower the surface that ran 8,000 gallons to the inch very much. So the pond filled steadily until October when everything was so dry that it just about seemed to hold its own.

There have been some interesting sidelights. For instance, the water birds found out about the pond immediately and the killdeer in the neighborhood spent a lot of their time around it, scolding and fussing—they sure are a noisy lot. Then there were two or three different kinds of terns, or sandpipers, those small birds, and another fair-sized bird which had a most peculiar jerky motion when it walked. In fact, I thought it had St. Vitus dance, but I was assured that that was normal for them, and it was called a teeter bird. Later on, a group of four of these teeter birds found the pond; they would come in about four o'clock every afternoon, flying in perfect formation and circling the pond about twice before they landed. They had more swank than a similar number of jet bombers, and they seemed to fly with even more precision.

One day Peter found a great big three-toed track at the pond, and he said, "What prehistoric creature could have made this track?" We looked around and found a blue heron on a tree not very far away, but I think he found poor going because he never came back.

People who are the most difficult to please are often the most worth pleasing.

Then there was a mother deer and her two fawns who came to visit the pond regularly. Perhaps they got their drinking water there. They disappeared two or three days before the deer season opened and I haven't seen them since.

What about fish? Perhaps my inclinations are a little like one of my neighbors who has had a pond

for about 3 years. He is a retired army colonel, and one day I said to him, "Colonel, you have trout in your pond, haven't you? Did you ever fish for them? He replied, "No, I gave two youngsters the privilege of fishing there, and they go over and catch a few once in a while." "Don't you like to fish?" I asked. "Oh sure," he said, "and while I was stationed in Florida, I went out on day fishing trips." "Well, did you catch anything?" I asked him. "Well, come to think of it, I didn't," he replied. I spent all my time taking pictures."

I am afraid that my inclinations about fishing are similar to the colonel's, but I have a son who is really a fisherman and he will delight in catching any fish that might be in the pond.

Now the question comes—what kind of fish should I put in? Everybody says to put in trout, but my wife, who is a bass fisherman from the Middle West, would much prefer to have bass or blue gills rather than trout. What should I do? The pond is really large enough so that I can have one of those small triangular flat-bottomed boats, and perhaps later, when the time comes, we can build a fireplace over a beautiful large monument-like rock that the bulldozer uncovered, and have "cookout" parties, boating parties in the three-cornered scow, and fishing parties—with a nice hickory nut tree handy for shade.

Let Calves Eat Roughage too

The cheapest feed for dairy animals is roughage. Hay is a good source of nutrients and helps build body capacity. Calves as well as cows should get it in their ration.

"Calves can be offered roughage when they are 10 days old," says Hollis Hall, extension dairy specialist, at South Dakota State College. Even though they won't eat very much they will get the hay eating habit. Give the calves fresh clean hay every day. Clean out feed mangers and bunks and feed the unused hay to adult stock. Replace it with tender leafy material.

Hall says that by the time the calves are four months old they can be fed from five to ten pounds of grass or corn silage per day. They should not be allowed to take all they can eat until they are at least eight months old. Feed a good quality grass-legume hay with the silage. Even though calves are on pasture they need some hay to furnish necessary nutrients. —*South Dakota State College*

You'll Like Vernal Alfalfa

It is winter hardy, wilt resistant, high yielding and it makes fine quality forage.

Condensed from
Wisconsin Special Circular 37

Dale Smith, R. A. Brink and L. F. Graber

VERNAL alfalfa is giving a good account of itself. Farmers rate it highly, even though they do not use precise methods for measuring the performance of Vernal. Some of its less tangible merits are hard to ascertain, even by scientific methods. In such cases, the judgment of experience is valuable. Vernal is meeting the test of the market over a wide area.

Unstinting in their praise, farmers say Vernal does not grow so coarse when rain relays harvest —that it holds on to its lower leaves better than other varieties —that it has finer stems—and that the leaves are darker green in color.

High Yields—Vernal alfalfa is a "quality" variety, yet it is tops in yields of hay in Wisconsin and elsewhere. The table which follows illustrates the comparative outputs of dry hay from two crops a year for four years.

Vernal yielded more than wilt-resistant Ranger and much more than the wilt-susceptible Grimm.

Vernal has a remarkable degree of persistence. It lasts. It is more resistant to cold and to wilt disease than any other commercial

Yields of Vernal, Ranger, and Grimm alfalfa at Madison, Wisconsin for 4 years.

	Tons of dry hay per acre				
Variety	1952	1953	1954	1955	4-year total
Resistant to wilt					
Vernal	3.96	3.92	4.59	3.82	16.29
Ranger	3.53	3.34	3.39	3.39	13.65
Susceptible to wilt					
Grimm	3.60	2.12	1.45	.43	7.60

Reprinted from Wisconsin Special Circular 37, published February 1957 by University of Wisconsin Extension Service, Madison, Wisconsin

variety. Farmers say that when other varieties die and the fields have to be plowed, Vernal holds its own. It can be plowed when they want to plow it. Persistence is a valuable characteristic.

Vernal excels in winter-hardiness and also in resistance to bacterial wilt, a destructive disease due to a soil-borne organism widely prevalent in the northern half of the United States. Although these characteristics do not make Vernal entirely winterproof, they do give the variety decided persistence in short or long rotations and especially where adverse weather conditions are combined with deadly infestations of bacterial wilt.

Vernal has a darker green color than Ranger. It is believed that this is derived, in part, from the yellow-flowered wild *falcata* parent. During leafhopper infestations, Vernal retains its green color for a few days longer than Ranger while with other adversities such as prolonged cool weather, the dark green color of Vernal may persist for several days. In Utah Vernal showed a marked tolerance to the disease known as yellow leaf blotch.

The capacity of Vernal to maintain a stand in mixtures with bromegrass has been outstanding in Wisconsin trials. Vernal, grown in association with bromegrass, was intentionally mismanaged with intensive grazing or clipping for three years. At the end of this period, the stand of Vernal was 41 per cent of the initial value whereas Ranger, given the same treatments, was reduced to 7 per cent.

Vernal is fine-stemmed and leafy. Because of superior winterhardiness and wilt-resistance Vernal can stand early cutting and also g r a z i n g practices which would quickly thin out stands of Common, or Grimm, or even Ladak and Cossack. Of course, no alfalfa will withstand gross managerial abuses. Three cuttings, however, during early bloom each season are feasible with Vernal, and early spring clipping or grazing healthy stands can be used as needed to delay the first and second cuttings and thus help stagger the haying operations on the farm.

During four years of harvest at Madison, Wisconsin, the yields from 3 cuttings of Vernal alfalfa taken each year at about tenth-bloom averaged 4.26 tons per acre or about the same as the yields (4.16 tons per acre) from 2 cuttings each year at late bloom. The yields of protein, however, for four years, totalled nearly three-fourths of a ton or 25 per cent more with 3 cuttings than with two. Ranger also performed well with 3 cuttings annually but the wilt s u s c e p t i b l e Grimm thinned rapidly.

Vernal alfalfa appears to be as

easily established as is Ranger. About the same rates of seeding (10 to 12 lbs. per acre on heavy soils) are required as for other varieties. In rate of recovery after cutting and in fall dormancy, Vernal behaves much like Cossack.

Vernal is a broad-crowned variety. It covers the ground well. It is not entirely winterproof, and no variety is. As yet, there are no known cases from winterkilling and wilt disease in Wisconsin. In Illinois, however, at one of four locations with field tests, both Vernal and Ranger in a two-year old stand, heaved more than other varieties during the winter of 1954-55. This trial (not yet completed) was on low, level, water-saturated, tiled and ditch-drained land. Even so, the stands of both Vernal and Ranger were still good in 1955 but many plants in both varieties had been killed or weakened by dislocation of the roots. In 1956, Vernal and Ranger had recovered from previous injuries and the stands and yields were very good whereas, the wilt-susceptible varieties were disappearing rapidly.

The acreage of alfalfa for seed in western states is increasing. About 2 million pounds of Vernal alfalfa seed were harvested and certified in 1954 and some 5 to 6 million pounds in 1955. This is a remarkably rapid development of a new variety considering the fact that Vernal was only released for seed increase on February 3, 1953. Limited trials indicate that Vernal alfalfa is a generally satisfactory seed producer.

Vernal alfalfa seed has been widely distributed for the production of forage and seed in the northern and western areas of the United States. It is also being developed in Canada where Ranger has not been recommended because of inadequate winter survival.

How well Vernal will continue to perform under such a wide range of conditions, remains to be seen. So far, Vernal has given an excellent account of itself.

Corn Biggest U. S. Crop

Corn, the United States' greatest crop, is grown in every state, Corn Industries Research Foundation points out. Leading states are Illinois and Iowa, contributing annually around 500,000,000 bushels each, or a combined total of one-third of the nation's 3,000,000,000-bushel harvest. The tiny state of Delaware harvested nearly 10,000,000 bushels last year—more than the entire continent of Australia.

Farm Equipment of the Future

Air-conditioned tractors and harvesters are on the way to make farming easier and more profitable . . .

Condensed from Farm Management

FARMERS know what they want in equipment—and they are setting the pace for equipment manufacturers.

Versatility, efficiency, ease of operation and comfort for the operator are the prime factors governing design and engineering of today's farm equipment—and indications are that equipment of the very near future will offer freedom from much farm drudgery of the past.

Probably the greatest treat in store for farm operators is air-conditioned tractors and harvesters. Not only will they be cool in summer—but there will be cozy heat in winter.

A practical, air-conditioned tractor has been unveiled at the experimental farm of an implement company executive.

The tractor is described as "the first step over the threshold into a whole new era of farming." It was designed and built by J. F. Schaffhausen, operational director of Cockshutt Farm Equipment, Inc., to reduce the fatigue and increase the income of farmers forced to work in extreme temperatures.

In addition to air-conditioning, the tractor's cab features "vista-vision," hot air heat for winter use, and a built-in push-button radio. Its practical value has been established through numerous tests at Schaffhausen's Open Gate Experimental Farms, in Bucks County, Pa.

Commenting on the new tractor, Schaffhausen said that year-around weather conditioning will soon be almost commonplace on all major farm implements.

Here are more customers for farmers. 1955 saw over 4 million babies born in U. S., the largest number on record.

"The days when a farmer had to work from sun-up to sun-down in scorching heat and freezing cold will then become only a bad memory," he said. "At Open Gate Farms we've proved that weather conditioning for tractors is practical, and I am convinced that farm machines without this feature will soon become as old-fashioned as automobiles without automatic transmission."

From a cost standpoint, Schaff-

Reprinted by permission from Farm Management, 4511 Produce Plaza, Los Angeles 58, Calif.

hausen explained that the air-conditioned cabs would run little more than the price of a good high fidelity sound system or a console color television set. "And when the cost is spread over the years the equipment will be used, the average farmer will be able to increase his efficiency, productivity and, most important, his life-span, for only a few dollars a week." He pointed out that hard work in extremes of heat and cold has been widely recognized as a contributory factor in heart ailments and circulatory disorders.

During the new tractor's introduction, it was emphasized that the present model is not a production model, but an experimental one. "When the market demand for such a tractor is evident, a production model will be planned," Schaffhausen said.

"However, after studying tests conducted to determine the air-conditioned tractor's practical use, and estimating the money saved as a result of increased operator-efficiency and reduced lost-time, I'm convinced that the demand will not be long delayed," he said.

One of the new air-conditioned tractors was recently presented to President Eisenhower for use on his Gettysburg farm.

Farmer Clifford T. Lyons of Hale, Mo., gave equipment manufacturers a tip as to what combine operators expect in modernized equipment when he constructed an efficient air-conditioned cab on his outfit for $700.

"Anyone who thinks this is a high price to pay for coolness and cleanliness on the harvesting job is cordially invited to ride the combine for a day or two without benefit of air-conditioning, before expressing any criticism," says Lyons.

It was freedom from dirt, more than heat, that first prompted the investment.

Top quality, early bloom, alfalfa hay is worth $17 more per ton than average hay when it's fed to milk cows.

"The operation deck is right out in front on the combine, about five feet above the ground," says Lyons. "When driving into the wind, chaff and dust from the grain, as it is fed into the threshing mechanism, fog up into the driver's face. And when there's a tailwind, chaff and straw being dropped from the rear of the machine swirl around the operator."

The combination of cab and air-conditioner was necessary to lick this job which Lyons describes as "about the itchiest and dirtiest one on the farm." The cab alone would have solved the dirt problem, but would have made the heat unbearable.

Farmer Lyons figures he's made a good investment.

How To Increase Field Efficiency

Here are definite suggestions on how to reduce machinery, labor and fuel costs on the farm . . .

Condensed from
Montana Farmer-Stockman

E. B. Wilson, Extension Engineer

INCREASING field efficiency of farm machinery reduces labor, fuel and machinery costs. Reducing costs adds to net profit just as much as producing more or getting higher prices.

Field efficiency is getting the most work from an implement in the field, or using the time for going instead of stopping, turning or traveling empty.

Here are 11 ways by which field efficiency might be increased. They may not all apply on your farm or ranch but your attention to them can pay you well.

1. Overhaul during slack winter months.

2. Make major adjustments in the shop.

3. Avoid unnecessary stops.

4. S t r e a m l i n e unavoidable stops.

5. Use larger seed boxes, fertilizer and grain boxes.

6. Make fields as large as practical.

7. Layout fields to reduce "to and from" travel.

8. Long, straight, rectangular fields reduce turning.

9. Work around a field or back and forth the long way.

10. Utilize the full width of the implement.

11. Do two or more jobs in one operation.

Let's think of these one at a time and see which ones can be used to increase the field efficiency on your farm.

The first one, overhaul during slack winter months, applies to every farm or ranch. Breakdowns and stops for repairs during field work time are very expensive. Most of them do not happen if the machinery is in good condition. Whether you do your own repair work or hire it done, there is no better time to get it done than in slack months.

A good heated farm shop is a "must" if you are going to do

Reprinted by permission from Montana Farmer-Stockman, Great Falls, Montana

all repairing yourself.

Knowing or remembering what repair work is needed is another "must." A good way of "remembering" is to carry a notebook and pencil during field work. Write down each item of repair or improvement that you notice. The most urgent of these can be done on rainy days and the others during slack months.

Another way of determining what repairs are needed is to make a thorough inspection. A good time to do this is when the machine is first put away after use. Since that probably isn't the slack season when you will do the repairing, your notebook will come in handy this time too. Examine bearings, belts, chains and tires. Look for broken or worn parts and loose or missing bolts. If there is any doubt about any part, make a note to take it off and examine it further.

Remember, too, that it might take some time to get repair parts. You will save shop time if you have the repair parts on hand before pulling the machine in and tearing it down.

Make major adjustments in the shops before going to the field as much as possible. This follows the theory that field time is most important and is time when you should be going instead of stopping. Such jobs as adjusting plow hitches, correcting lead and register on a mower, setting grain drills and the like can be done first in the shop during slack season time so that a minimum of adjustments will be necessary in the field.

Unnecessary stops such as moving large rocks, trees, trash and other field obstructions can be avoided by taking care of them in slack season.

Some stops are necessary and unavoidable. For example, filling drills and fertilizer spreaders or emptying the grain tank on a combine. These jobs can frequently be streamlined so that "stopped time" is shorter.

A little planning on the spotting of seed and fertilizer to fill the hoppers can make a big difference. If these items can be handled in bulk and handled mechanically you are really saving field time.

Unload on the Go

Unloading a combine grain tank "on the go," if done successfully, can increase field efficiency as much as 30 per cent. It's easy to figure that one out. Suppose you are cutting 40-bushel wheat with a 14-foot combine traveling 4 miles per hour. This figures 6.8 acres of 272 bushels per hour. This is about six 45-bushel tanks or one tank every 10 minutes.

If your combine is stopped 5 minutes at each unloading you will only be operating 10 minutes out of each 15 or two-thirds

of the time. In other words, if you can do the unloading on the go you will save 5 minutes out of every 15 thereby increasing field efficiency by 33 per cent.

What is one-third of yours and your hired man's time worth during harvest, and how much is it worth to you to get through harvesting a few days earlier to beat winds, rain or hail? Of course, you can't always save 5 minutes out of 15. The amount you save depends on the yield of grain, your speed of travel, the availability of trucks and the skill of the operators. Generally, however, it will pay you to consider taking the grain on the go.

Reduce Stops

Using larger seed boxes, fertilizer and grain boxes will reduce the number of stops, probably slightly increase the length of each stop, but will increase the over-all efficiency of these field operations. In selecting new machinery, this is a good thing to keep in mind. Frequently the capacity of drill boxes and grain tanks can be increased in the farm shop without overloading or putting too much strain on the frames of the machines.

Large fields can be worked more efficiently than smaller fields. A smaller proportion of the time is used in getting started, finishing and going to and from the field. When a field is finished there is almost always a part of the last round that overlaps work already done. The smaller the fields the more of these finishing rounds will be required for a given acreage.

This overlapping on the finishing round generally increases with the width of implement used. For example, with an implement that is 28 feet wide you may have to overlap as much as 27 feet for the last half of a round in finishing a strip. An implement only 10 feet wide might have to overlap as much as 9 feet, but this is only one third as much as the wider implement. This doesn't mean that narrower implements should be used, but it does point up the need for planning the width of strips and implements to reduce this overlap loss.

Nonproductive time loss can sometimes be reduced by arranging rectangular fields to run away from the farmstead. In this way, field work can be done while traveling to and from distant parts of the farm. Cattle guards instead of gates can save much time on livestock farms.

Long, straight, rectangular fields reduce turning time. This doesn't mean that it helps to cut up a large field into several long narrow ones, but if a large field must be cut up into smaller ones for other reasons, then it is best to create long, narrow fields instead of square ones. The number of turns is directly propor-

tional to the width of the field. For example, a 40-acre field that is ¼ mile square will have twice as many rounds, with 4 turns per round, as a 40-acre field half as wide and twice as long.

Take Full Swath

Utilizing the full width of equipment depends upon the type of implement, the speed of travel, the lay of the land and to a large degree, the skill of the operator. A good operator can make his wages by taking a full swath. Consider a combine traveling 4 miles per hour for a 10-hour day. If the operator misses taking a full swath by an average of one foot he will miss, in a day's work, a strip 1 foot wide and 40 miles long. This is nearly 5 acres. At $4 per acre as the cost of custom combining that is $20 a day loss. In other words, an operator who can take a full swath without missing may be worth up to $20 per day more than the operator who, on the average, misses a foot of getting a full swath.

Do two or more operations on one trip over the field if the value of the work is not decreased and you have adequate power. For example, if you need to disc, fertilize and seed a field, consider doing all three jobs in one operation. You will not only use the time more efficiently, but will get better efficiency out of the tractor and its fuel as well.

Cattle Numbers Are Down

For the first time in seven years, cattle numbers are down in the United States. A nation-wide drop of 2 per cent in total cattle numbers last year coupled with recent widespread rain creates a better-than-average chance for higher prices.

The long drouth was largely responsible for this decline, and cattle numbers have not yet turned downward in either the South or Midwest although Texas registered a 7 per cent reduction in 1956. Actually, national numbers are now at a point of balance and could swing either way if moisture conditions keep on improving.

Extension Economist John McHaney says cattle prices will probably improve if rains continue to fall at the right time and in the right places. He figures this would cause many ranchers to restock, holding back a good many heifer calves from slaughter. He says it also might create a better demand for steer and heifer stockers.

McHaney says American cattlemen can generally expect higher cattle prices in a few years if the over-all economic activity and non-farm income remains high. He bases this prediction on the declining cattle to people ratio in recent years with the assumption that it will continue. *—Texas A & M College*

Pregnancy Testing Boosts the Calf Crop

Experiment station tests show that eliminating the "free loaders" can raise gross income by $7.88 per cow wintered.

Condensed from
a Colorado A & M College Release

PREGNANCY testing can increase the cattleman's calf crop by 10 per cent and his gross income by $7.88 per cow if results are comparable to those obtained by the Colorado A & M College Experiment Station.

Here's what Dr. Howard Stonaker, experiment station animal husbandman, reports on work done with the test herd at the college's Fort Lewis branch station:

Pregnancy-tested cows produced 10 more salable calves per 100 cows wintered than did those not tested. Normal calf crop for this herd was 77 per cent; pregnancy testing boosted this figure to 87 per cent and raised gross income by $7.88 for each cow wintered.

"We know that every cattleman realizes the extra expense involved in carrying a barren or open cow through the winter," Dr. Stonaker says. "The main purpose of pregnancy testing is to eliminate the 'free loading' cows and make the herd more efficient and more profitable."

The testing fee is nominal, according to Dr. Lloyd C. Faulkner, professor of surgery and clinics at the college bull farm. He estimates the cost of testing a herd at from 50 cents to $1.00 per head, depending on number tested. Some veterinarians, he says, charge a flat rate of $100 a day, testing from 150 to 200 head.

Best time to test cows for pregnancy is about two months after the bulls have been taken out or at weaning time. During the test, the veterinarian may also detect diseases or deficiencies that can eliminate the cow from the brood herd.

Whoever acquires knowledge but does not practice it, is like one who ploughs a field but does not sow it.

Pregnancy testing is done by inserting the hand into the rectum and gently palpating or handling the uterus and ovaries through the wall of the rectum. The hand

Reprinted from an Information Service Release, Colorado A & M College, Fort Collins, Colorado

never comes in direct contact with the productive organ. The condition of the ovaries, the uterus and even the presence of the small calf determine pregnancy.

Dr. Stonaker emphasizes that the testing method is good, but not foolproof. Specially trained personnel should always perform

Population of the United States is increasing rapidly enough to populate a new city of 100,000 each week.

the service; otherwise good cows might be culled. Accuracy of diagnosis by a skilled technician is almost 100 per cent.

To show advantages of pregnancy testing to eliminate undesirable cows from the herd, Dr. Stonaker points to these statistics:

In the period 1952-54, a total of 311 Fort Lewis cows were turned in with the bulls. Of these, 20 were sold for reasons other than pregnancy and 41 were diagnosed as "open." Total number of cows wintered was 250 and total number of calves weaned was 216.

Testing for pregnancy offers an additional advantage to the cattleman who owns high priced registered stock. Early detection of open cows offers an opportunity for special care or hormone treatments that may increase chances of conception.

Further evidence of the value of pregnancy testing of registered cows is illustrated on the Haystack Angus ranch near Longmount. This ranch guarantees that every cow sold will be delivered with normal calf at side.

"We can't take chances on pregnancy," says ranch manager Austin Moody. "We have to know a cow is pregnant before we sell her with that guarantee before she calves. Pregnancy testing gives us this answer and it gives our buyers the kind of assurance they like."

Paul Pattengale, Colorado's Extension animal husbandman, feels that the pregnancy testing is just as valuable to the commercial cattleman. "Under average conditions it will cost about $50 to keep a cow over until the fol-

An optimist is one who sees opportunity in difficulties; a pessimist sees difficulties in opportunities.

lowing breeding season. If you have to buy outside feed, this cost may be even higher."

"Any cow that fails to produce a salable calf loses you money," says Pattengale. "The loss from an open cow may not be as easy to see but it is just as real as the loss from a calf that dies after birth."

The Trend's Toward Early Weaning of Baby Pigs

It puts a premium on and pays a premium for good management . . .

Condensed from
an Iowa Experiment Station Release

Advantages of Early Weaning

"Better-doing" pigs — You can feed the pig directly on rations highly fortified with essential vitamins, antibiotics, arsenicals or trace minerals. Pigs are no longer dependent on the sow's uncertain milk flow which reaches a peak at 3 weeks after farrowing then gradually declines. Pigs "hang-on" trying to get enough from their mother while she continues to give milk—regardless of how little—and they are reluctant to start eating even the most palatable pig ration. By early weaning you can full-feed proper rations to pigs and get 10 to 20 pound heavier pigs at 8 weeks of age.

Fewer Runts — By full-feeding baby pigs off sows you will have fewer runts and stunted pigs—no problems of "robbing" or too few "dinner plates." By using farrowing stalls and early weaning, you can go through and wean the heavier pigs off sows and leave the small pigs on to nurse longer. This, with equalizing litters at farrowing time and full-feeding will give you a more uniform pig crop.

Sows Don't Lose Weight — By weaning pigs from sows when they weigh 8 to 12 pounds (2 to 3 weeks of age) sows do not lose the 50 to 75 pounds usually "nursed off" in an 8 to 10 week nursing period—even when self-fed. Sows that do not lose weight when suckling a litter for 8 to 10 weeks either have small litters, are poor milkers or both.

Age often lessens the joy of living, but not the desire.

Saves on Sow Feed — Early weaning will cut your sow feed bill more than half because sows eat twice as much feed every day during lactation (10 to 15 pounds per day) as compared to gestation (5 to 8 pounds per day)—and lactation rations cost more per pound.

Less Sow-to-Pig Diseases —

Reprinted from an Iowa Agricultural Experiment Station Release, Iowa State College, Ames, Iowa

Early weaning reduces the incidence of disease (and parasites) transmitted from the sow to her pigs. Early weaned pigs stay healthier with less incidence of anemia and scours. Field experience shows that weaning pigs weighing 5 pounds or more onto Iowa State College "75" pre-starter immediately following outbreaks of transmissible gastroenteritis (TGE) reduces the incidence of mortality and stunting effects of this disease.

Extension dairymen say the return for each dollar spent for feed is a good yardstick to measure efficiency. Indiana DHIA figures for 1954-55 show that each dollar's worth of feed marketed through dairy cows averaging 11,000 pounds of milk returned $2.79. The same amount of feed consumed by cows averaging 6600 pounds of milk was $1.94. Unless a return of at least $2.00 is received for each one dollar of feed consumed, other overhead items such as labor and depreciation will not be covered.

More Pigs Saves — With the sow "out-of-the-picture" there is no further over-laying or crippling. New dry pre-starters can save "distress" pigs—those on sows that die or go dry.

Sell or Re-breed Sows Sooner after Farrowing—This saves time and labor. By early weaning the heavier pigs, the small pigs in the litter can be transferred onto either the better or the poorer sows depending on whether you want to first get the better sows rebred or the poorer sows sold.

Less Labor is Needed — Early weaning saves handling the volume of feed, bedding and manure required by sows nursing litters. Pens stay cleaner and drier. Less total bedding is needed for the pig crop. Less cleaning, less feeding, less bedding and manure handling with faster growing, better-doing pigs with early weaning means less total labor required.

Baby Pigs Are Very Efficient Feed Convertors — Baby pigs will make a pound of body weight gain on 1.7 to 1.9 pounds of ration up to 8 weeks of age. Pigs at 100 or at 200 pounds of weight require 3.4 and 4.3 pounds of feed per pound of gain respectively. Therefore you can afford to pay more per pound of pre-starter or starter for baby pigs than you can for a pound of growing finishing hog ration.

Less Floor Space Required — Sows take up space! With the sow gone 2 to 3 weeks after farrowing, you can provide smaller but better farrowing and pig starting facilities.

Speeds up Swine Breeding and

Feeding — Both on the farm and in research, this means correcting mistakes quicker and applying new, better practices sooner to make more money out of hogs.

Encourages Multiple Farrowing — The development of successful, practical early weaning of baby pigs encourages swine producers to spread their farrowing throughout the year — especially throughout the winter months. Multiple farrowing results in more uniform marketing.

Requires Special Pre-Starter — Just any pig starter ration will not do a successful job in starting early weaned pigs (at 8 to 12 lb. or 2 to 3 weeks of age) on dry feed. It takes a special pig pre-starter (meal or pellets) similar to Iowa Pre-Starter "75".

Early Weaning Takes Better Than Average Equipment — At first this may appear to be a disadvantage especially to some who are trying to raise pigs with sow; however, the many advantages of early weaning will encourage hog producers to provide the proper housing and equipment they should have anyway. Early weaning does not require any better facilities than most good hog producers already have in raising pigs on sows.

Requires Good Management — Early weaning requires good, careful management, but this is returned in more profits. You cannot neglect pigs once they are weaned from the sow. The old sow helps to cover up poor management practices — inadequate rations, failure to feed and water regularly, etc.

Push Button Plowing? — Just Imagine!

It seems now that we may be moving fast toward a time when the plowman will not homeward have to plod his weary way.

This promise, if it may be called that, is implicit in the announcement that our army has tested at Fort Belvoir a robot tractor that can be operated by remote control. That is to say, the machine can be made to do a good job at ranges up to 15 miles from human contact, merely through a push button procedure. Militarily speaking, it could be of great value in terms of enabling men in distant jeeps or helicopters to put it to work in radioactive areas or combat zones.

As for its nonmilitary significance, some far seeing observers predict that the thing will soon bring on the day when farmers will plow their fields simply by pressing a button here and there as they sit at home watching television or just lolling around.

—From the Washington Star

Developing a Purebred Dairy Herd

A successful Holstein breeder speaks from experience . . .

Condensed from Holstein-Friesian World

Jack Fraser

IF YOU are not keenly interested in farming and take no great delight in livestock then this business is not for you! Success here, as in any other venture, requires genuine interest. If you like the work, however, agriculture and livestock breeding, the oldest and most essential industry in the world, offers great satisfaction, modest financial security, and abundant opportunity for worthwhile achievement.

I would say that there are two kinds of farm that can be profitable and practical. One is the small family unit where one starts small and is self-contained as to labor. You might have to have some custom work done. In this case the income is smaller, but the expenses are too.

The other method of operating, where one is financially able, is a larger setup permitting different types of farming intensively. The trend is to this type. It requires larger machinery and enough land to support it.

A good dairy herd may be the chief source of income. From this you may build the fertility of the soil without purchasing too much expensive fertilizer. Your legumes help to build up the land and produce high-protein feed for your cows. This puts your land in shape to grow any cash crop that does well in your locality. From this we get crop-rotation, which I think is the secret of good farming.

The first mentioned method of starting, as a family unit, is probably the way most small breeding establishments start, and then sometimes grow into a large, well managed unit in the next generation. (That is if you are fortunate enough to have a couple of sons stay with you on the farm or a couple of daughters who marry good farm boys.)

On our farm we like to grow everything the cows will eat with the exception of concentrates. I would say the first and most important crop we grow is grass and

Reprinted by permission from Holstein-Friesian World, Lacona, New York

hay, and we like it with lots of legumes like alfalfa, red clover or ladino. This produces feed high in protein, and thus cuts down on concentrate buying.

We do not use any commercial fertilizer on our hay or pastures. I would rather have a nice even crop standing up than a heavy tangled mass. I think you will have more quality in your hay if it is not too big and coarse. We sow a mixture of about 10 pounds of alfalfa, three pounds of red clover, and one pound of ladino, two pounds of timothy and about three pounds of brome grass. We cut this crop for hay for about two years. This gets rid of most of the annual weeds. We will then pasture this field for a year and then plow it up and grow corn for silage, or sow to oats or possibly wheat. We have tried grass silage, but do not like it as well as corn. The cattle do not like it as well, and we can grow more corn per acre. I also think you have a better balanced feed with corn silage and a good hay mixture with plenty of legumes. We grow all of our oats, and feed this with a little concentrate on top.

Practical Dairy Breeding

You may already have a purebred herd, or you may just be starting to get some purebreds. Just how you go about it must depend somewhat on your finances. I think the old saying that your bull is half your herd does not mean so much now as it did at one time, but he does have an influence on your entire herd. A cow doesn't have as many offspring. But if I were just starting I would want to have a cow or two (or more if possible) from the best cow families I could afford to buy. *I would rather have an ordinary cow from a good family than a top cow from an ordinary family.* The farther back your good cow family goes without a break, the better chance you have for good breeding. *I would then breed my entire herd from the family or families that I liked best.*

Once when I was a boy at home with my father I picked up a cow for $75.00 that was a wonderful type animal and had great promise of production. We had never shown at a major show, but people told us that we should show this cow at the Royal Winter Fair. My father said to go ahead and that when I was showing one I might as well show a couple of calves, too. We brought these calves from the pasture. They weren't bad, but we knew nothing about showing, and he clipped them all over. They looked like a pair of sheared rabbits. We won nothing on the calves but the cow came in third.

We had many chances to sell her, but I thought that every calf that cow would have would

be a show winner. We were offered $600, but kept her. She produced well, because I milked her four times a day, and she made 33 lbs. of butter in a week. The fact I wish to point out is that this cow, although she was good type herself, did not reproduce that way. We never got a decent animal from her. *It is better to buy where good bloodlines are.* I am sure that they will breed better. I do not believe you have to have the highest record cow, either. A cow that will produce from 12,000 to 15,000 lbs. in a good farmer's herd is as good as one that produced 20,000 lbs. in expert hands. The cow that goes on producing and reproducing every year is better than the one that makes a high record once in a while.

In England, Lassie, a 10-year-old police dog, has been awarded a bronze medal by the Canine Defense League. Lassie saved her master recently by pushing him out of his bed when fire broke out in his home.

I would advise always to avoid extremes—the extreme dairy cow, the extreme thick cow, the extreme high tester. They do not usually breed as true as the in-between ones do.

I would also advise against buying from a famous bull just because he is famous. True, if the animal you purchase is from a great bull and a great cow family, that is ideal. But many times one just starting buys an animal sired by a famous bull, and because he does not feel that he can afford the offspring of a famous cow family he takes one from an ordinary cow family and the results are usually disastrous. This applies to foundation females, and especially to bulls. Many times also, we over-rate bulls from high record cows that have been pushed. These same cows would probably be ordinary producers in a farmer herd, and we wonder why his offspring do not live up to our hopes.

It is my personal belief that a bull will breed more to his granddam than to any of his other ancestors, but if you have a full pedigree all the way back you are much less likely to get misfits. To summarize what I have said about selection, I would like to stress the importance of cow families, and again point out that *I would much prefer to have an ordinary cow from a good family than a top animal from an ordinary family.*

Better to Buy Cows

I believe that in making additions to your herd, or when starting a herd, *cows are the best buy,* or possibly heifers right up to calving and showing much evidence of type and production.

We breeders always think that every calf or heifer we have is going to be a record breaker or a grand champion and we price them accordingly. We find that after they calve half of them are priced for less and the rest of them about the same as when they were calves. Buyers of calves are great gamblers.

A hog breeder once told me that at his sales you could bring out a sow with eight pigs four weeks old and she would sell for $100, but bring out one that had not farrowed and she would sell for $125 because the buyer thought she would maybe raise 12 pigs. Yet we all know that the average number of pigs raised per litter is eight or less. The same holds true for buying calves or heifers. The average that turn out well does not equal buying a cow. You *know* what she is like, and she will have a calf or two before the other freshens and will have produced milk as well.

Cow Care

In my opinion, feeding, care and management of a herd contributes at least 60% of the results we may obtain. If we are to maintain a top purebred herd of high producing, good type cows, they must have good care.

I will discuss cows first. *I do think that we try to get too much milk from our first and second calf heifers.* I know that this proves your bull and you immediately start to sell his sons on his daughters' first and second calf production. Our tendency has been to breed from these early maturing heifers, but many of them may be out of the herd by the time they are six years old—not always on account of their genetic make-up, but often because we have crowded them too much.

Then I would like to say that we try to get too much milk out of our cows and heifers in the first two months of their lactation. I have learned from experience that we get more udder trouble at this time than at any other time. Feed the fresh cow very light, something such as beet pulp, good legume hay, and maybe a bit of oats and bran. Avoid heavy feeding and see that the cow's manure is loose. After all the swelling has gone from her udder and her appetite is becoming keen, she may start to decrease in milk and then you can start to feed her more.

Now each cow is different. An extreme dairy cow will probably have to be fed a feed lower in protein, with maybe more beet pulp and corn silage, hay, and something like oats or corn. I also think one should feed a smaller amount of corn silage at calving time. Some cows of a thicker type can be fed more protein. Get the fat off them and they will do well. I agree with

the old saying that "The eye of the Master fatteneth the beast." *It is a question of knowing each cow.* That is why some small breeders do exceptionally well.

Don't Pamper Heifers

Some years ago I remember seeing a large firm buy all the top cows at all the sales around, and at the same time they bought the top bulls to breed them to. I was depressed with the feeling that the small breeder did not have much chance against this kind of competition.

Wife, reading her husband's fortune on a weight card: "You are dynamic, a leader of men, and admired by women for your good looks and strength of character. It's got your weight wrong, too!"
—The Rotarian

On my way home from one of these sales I visited two or three of these large farms, and as I went down the rows of cows I saw many very good type cows that were fat, others with udder trouble, and many with low hanging udders. In fact there were not more than a few that I would have wanted to buy. I asked to see the heifers, and in each case was shown nice smooth youngsters in excellent condition. It was evident that they wanted their heifers looking well all the time when anyone came to the farm. The breeding was really there, but I do not think that's the way to raise heifers.

I like to see calves or heifers with well placed teats, hanging straight down (not pointing out), and the udder just skin and teats. These usually make the best udders.

To produce a good dairy cow I feel that the calves may be well fed for the first six to eight months. Then I think they are better off to rough it until they are four or five months in calf. Heifers can be kept growing with less high protein and less fattening feed. We feed our calves about five pounds of whole milk for three months. I think they might be better if they got whole milk for the first month and then skim milk.

We try to have our heifers calve at from 24 to 32 months of age, depending upon the heifer—her size and type—and also a bit depends on the time you are going to need the milk. I believe the feed companies recommend more feed and having them calve at two years of age, but I am inclined to think that we should feed more roughage, that if they calve a bit older they will make better cows, and that it will not cost as much to bring them to this stage. Hay, corn silage and grass are the cheapest feeds we have. *Here again, you should*

study your own cattle, for they are all different.

We like to have our heifers running loose, but our cows tied up. In this way the heifers can all have all the roughage they want, while our heavy producing cows can be fed individually. I think cows look better tied up. I have heard our milk testers say that they have never seen a cow give 80 pounds a day in loose housing, and very few give 60 pounds.

Winter Exercise

On one of our farms we have what used to be a shed or large box-stall beside the cow stable. In winter we let three cows out every day, the next three out at night, and so on, until the whole row has been out either for a night or a day. In this way each cow is out every three or four days and this method seems to work out well, each cow getting some regular exercise during the winter months.

I mentioned before that I did not think cows should be fed too heavily at calving time. Cows well fed but not over-fed will produce milk more economically, will breed more regularly, and have less udder trouble than the cow that is pushed hard. The last 2,000 pounds from a crowded cow is the most expensive milk she can produce. The one advantage is that her offspring will sell for more money, but they are not really any better.

One of the most costly things about a dairy herd now is veterinary service and drugs. Here an ounce of prevention is worth a pound of cure. We must detect disorders at the start. I believe mastitis to be our greatest worry among cows. Most of it is caused by poor milking and too heavy feeding, especially, as I mentioned before, in the first month or two of a lactation. The other troublesome time is when we are drying a cow off. In our herd we watch them closely at this time and treat each teat with a boojie, or whatever antibiotic you may prefer, at the very first sign of any trouble.

We give practically all of our cows calcium at the time of calving, usually as soon as they calve. We think they clean better and get away to production quicker.

Culling

Now, for my thought on "selecting for improvement of our herd." I feel that if we call ourselves breeders we should follow some type of production test. We cannot know our cows without production records. I think we should also have our herd under Selective Registration (type classification). Sometimes we think we know more than the classifier does, and maybe sometimes we do. But the value of an unbiased expert opinion can be helpful—

and we can always use our own judgment.

In some cases where the breeder is not too good a judge, I have seen cows go VG that would have been sold at the same price as less typy animals. You may have some cows from good families that do not come up to your standard of type, but which are still better than the average in some herds. But if you have some that are off-type, or poor producers, or hard milkers, send them to market. Don't sell them to a new breeder.

If the best, most modern farming methods were used, about one-third of the family farms in the United States could not provide full-time work for one able-bodied operator, according to the U. S. Department of Agriculture.

Don't be too critical of the production of your 2-year-olds — they will most likely improve with age. I think our best cows start off this way.

Show Your Cattle

When you get your herd pretty well established, and you are improving it all the time, the best means to arrive at its value is to show your cattle. Start first at your local fair or show and work up to the larger shows. You arrive at values by comparison, and nothing you can do will increase the market value of your cattle more than showing. It is about as good a means of advertising as there is.

Even at your small local fair many people will see your cattle, and they will remember you. I am reminded now of the way the late R. B. Holtby used to argue the importance of the show ring. He said it was like the engine on a train, the part that takes you ahead. Remove the engine and you will coast along for a while but soon will come to a stop. I believe Bob was right for I have seen this very thing happen. Many a breeder has exhibited his cattle for a few years, then stopped, coasted on their momentum, and then been forgotten by the buying public.

Please don't get me wrong: I am show minded and have done pretty well in the show ring, but I think that reasonably high production comes first. A show cow and one that grades high must have indications of production, and as a general rule they do. This is proven in classification work by the fact that the Excellent cows average higher in production than the Very Good cows, and the Very Goods are higher than the Good Plusses, etc. You will also find that the best lifetime performance is made by the better type cows, for they are built to last longer.

FARM BOOK REVIEWS

Beef Production

By Diggins and Bundy. Published by Prentice-Hall, Inc., Englewood Cliffs, New Jersey. 335 pages. Very well illustrated. Full color cloth binding. 1956. $5.85.

An attractive, easily read book that covers its subject well. Discusses everything from opportunities in beef cattle to how to fit and show them. For the feeder or breeder, this book carries a great deal of information.

Farm Manual

Published by Popular Mechanics Press, 200 E. Ontario Street, Chicago, Ill. Released in April 1957. 224 pages. Every page illustrated. Cloth. $3.00.

An encyclopedia of illustrated, handy mechanical ideas for the farm. Sections cover farm machinery and implements, tractors and accessories, poultry and livestock, improvements, maintenance and handy kinks. Many ideas that will save you money.

Backbone can help you to success if the knob at the top isn't made of the same material.

The Range and Pasture Book

By Donahue, Evans and Jones. Published by Prentice-Hall, Inc., 70 Fifth Ave., New York 11. 1956. 406 pages. Well illustrated throughout with four color cloth cover. $6.00.

Ties in with the increasing interest in grassland agriculture. Here is information about the principles and practices of grassland management. Its big advantage is a recent publishing date. Covers grass and grassland agriculture generally but also includes two chapters on the relation of grassland management to watersheds and wildlife.

Keep Your Eye on the Ball. Keep your shoulder to the Wheel; your Ear to the Ground.
Now, try to work in that position.

Breeding and Improvement of Farm Animals Fifth Edition

By Victor A. Rice, F. N. Andrews, E. J. Warwick. Published by McGraw-Hill, New York City. Available in May. 535 pages. Probable price $8.50.

An advanced study of animal breeding. It contains sections on physiology of reproduction, inheritance, breeding systems and selection. It presents the principles underlying animal improvement, and shows how the principles can be put to work to improve both the type and productive performance of farm animals. Physiologic and genetic aspects of breeding are given special treatment in the fifth edition.

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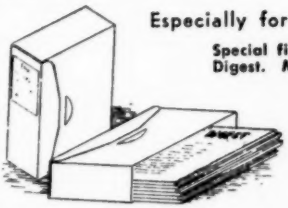

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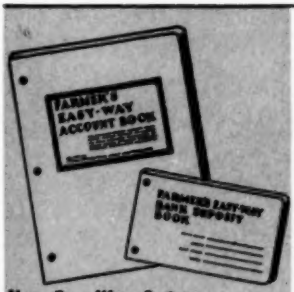

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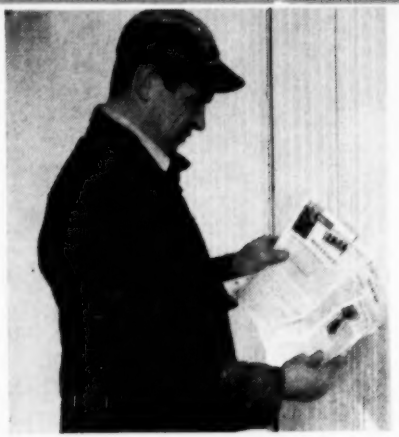

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